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## ABSTRACT

A transportability study was conducted to determine if multidisciplinary knowledge necessary for elementary school teachers was also relevant for newly licensed (certified) secondary school teachers. The results of the study may be used to study the possibility of developing a test of multiple subjects for all teachers. Form 1 of the Education in the Elementary School job analysis previously developed for elementary school teachers was modified to make it appropriate for administration to a national group of secondary school teachers in middle, junior, and high, or comprehensive secondary schools. The revised knowledge inventory, a measure of multidisciplinary knowledge, was sent in survey form to 5,100 secondary school teachers across the United States. Respondents were asked to rate the individual knowledge statements using a five-point importance scale. Frequency distributions across background information categories, mean importance ratings, and correlations of mean ratings among subgroups were performed. Of the 140 statements in the inventory, 56 (40%) fell below the cutpoint for one or more relevant subgroups. The 84 statements that were identified as important should be used as the foundation for test specifications. Six appendixes contain the survey and supplemental information about responses and respondents. Nine tables present survey findings. (Contains five references.) (SLD)

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# Inventory of Knowledge of General Subjects: A Transportability Study

**Anne Reynolds**  
**Michael Rosenfeld**

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## Knowledge of General Subjects: A Transportability Study

Anne Reynolds, Ph.D.  
Michael Rosenfeld, Ph.D.

### Executive Summary

A transportability study was conducted to determine if multidisciplinary knowledge necessary for elementary school teachers was also relevant for newly licensed (certified) secondary school teachers. The results of the study may be used to explore the possibility of developing a test of multiple subjects for all teachers, regardless of subject matter or school level taught. The report presents the methods used to create the Inventory of Knowledge of General Subjects, describes the statistical analyses conducted, and offers conclusions regarding the relevance of the multidisciplinary content for newly licensed secondary school teachers.

Form 1 of the Education in the Elementary School job analysis inventory was modified by ETS staff to make it appropriate for administration to a national group of secondary school teachers. Secondary school teachers included those who taught in the middle, junior high, high, or comprehensive secondary school. The purpose of the transportability study was to determine how relevant the multidisciplinary knowledge covered in the inventory is for secondary school teachers. The revised knowledge inventory (Knowledge of General Subjects) was sent in survey form to 5,100 secondary school teachers across the United States. Respondents were asked to rate the individual knowledge statements using a 5-point importance scale.

Three types of analyses were conducted: (1) frequency distributions across background information categories (e.g., sex, years of teaching experience, school level); (2) mean importance ratings by relevant subgroups; and (3) correlations of mean importance ratings within relevant subgroups. A cutpoint of 2.50 (midway between *Moderately Important* and *Important*) was set to differentiate between important knowledge and unimportant knowledge for consideration in a test of multiple subjects. Knowledge statements that received a mean rating of less than 2.50 by any of the relevant subgroups of respondents (school level; geographic region; sex; race/ethnicity; years of teaching experience) were identified. Test development staff were advised to use knowledge statements that were rated above the 2.50 cutpoint for consideration in developing a test of multiple subjects. However, if test development staff determined that the reason for inclusion of particular knowledge statements that fell below 2.50 was compelling, then they were requested to provide a written rationale for the inclusion of the statements.

Of the 140 knowledge statements on the inventory, 56 statements (40%) fell below the 2.50 cutpoint for one or more relevant subgroups. Fifty-two of these statements were rated below 2.50 by respondents by school level; an additional four statements were rated below 2.50 by the analyses of other relevant subgroup of respondents (e.g., female, less than two years of teaching experience). For 22 knowledge statements (16% of the total knowledge statements), one or more subgroups gave ratings of less than 2.00 (*Moderately Important*).

The 84 knowledge statements that were identified as important by the surveyed teachers and teacher educators should be used as the foundation for the development of test specifications. It is reasonable to assume that, due to testing and psychometric constraints (e.g., time limits, ability to measure some content reliably), not all of the identified content

may be included on assessment measures. One source of information that may be used to guide the test development staff in their decision of what content to include on the assessment measures is the mean importance rating. Although a rank ordering of the content by mean importance rating is not implied, it is recommended that initial consideration be given to content that is well above the cutpoint and represents the appropriate breadth of content coverage.

Correlations for relevant subgroups were .94 and above, which suggests that there is substantial agreement among various subgroups of teachers with respect to the relative importance of the multidisciplinary knowledge needed by newly licensed secondary school teachers.

Evidence was also provided in this study of how well each domain was covered by the specific knowledge statements and the overall importance of each knowledge domain. The results suggest that all of the domains were either adequately or well covered by the specific knowledge statements. Additionally, results indicate that all of the knowledge domains were judged to be at least moderately important for the newly licensed secondary school teacher. Finally, suggestions were offered regarding the relative weights each domain should receive in test specifications for an assessment of multiple subjects for secondary school teachers.

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## Teachers' Knowledge of General Subjects: A Transportability Study

### Introduction

New developments in psychological and educational research, measurement, and technology, as well as recent national discussions about the preparedness and effectiveness of teachers, have spurred Educational Testing Service (ETS) to develop a new generation of teacher assessments (Dwyer, 1989). This new assessment system, called The Praxis Series: Professional Assessments for Beginning Teachers™, is designed to be used by states as part of the process they employ to license or certify their teachers. The new system will consist of three stages. Praxis I: Academic Skills Assessments are designed to be used by states to decide whether prospective teachers have the basic academic skills that serve as the foundation for teacher development and practice. Basic academic skills (e.g., reading, writing, mathematics) are judged to be important for teachers regardless of school level or subject matter taught (Rosenfeld & Tannenbaum, 1991). Praxis II: Subject Assessments measure knowledge of subject matter (e.g., biology, social studies, Spanish), general principles of teaching and learning, and content-specific pedagogy. Praxis III: Classroom Performance Assessments are performance-based measures of the beginning teacher's application of teaching knowledge and skills.

This report presents the results of a transportability study in which one of the Praxis II job analysis surveys (Education in the Elementary School: Form 1) was administered to secondary school teachers across the nation. The original Form 1 survey was developed with elementary school teachers and teacher educators to cover the multidisciplinary subject matter important for elementary school teachers to know in order to competently teach the elementary school curriculum. (The Form 2 survey covered knowledge of content-specific pedagogy and was inappropriate for use in this transportability study.) In the original administration, Form 1 was sent to elementary school teachers. Test development staff felt that the multidisciplinary knowledge covered in Form 1 might be important for newly licensed secondary school teachers as well. Thus, a transportability study was conducted to determine how important this multi-disciplinary subject matter knowledge would be for beginning secondary school teachers<sup>1</sup>. If appropriate, the results of the study will be used to explore the development of a test of general subjects for all teachers, regardless of subject matter or school level taught.

This report details the study conducted to determine if the multidisciplinary content contained in Form 1 was judged to be important for secondary school teachers. The report describes the group of teachers who participated in the study, the statistical analyses conducted, the results of these analyses, and implications of the results for test development.

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<sup>1</sup>"Secondary" refers to both middle/junior high school teachers and high school/comprehensive secondary school teachers.

## Methods

### Developing and Modifying the Form 1 Inventory

This section briefly describes the development of the Form 1 inventory of Education in the Elementary School and details how the Form 1 inventory was modified for purposes of the transportability study.

Developing the Form 1 inventory. Detailed information about the development and administration of the Education in the Elementary School: Form 1 inventory is provided in a separate report (see Reynolds, Tannenbaum, & Rosenfeld, in preparation). What follows is an overview of the job analysis process used to construct the inventory.

Initially, ETS staff constructed a draft job analysis inventory of the knowledge needed by elementary school teachers in order to teach the content usually covered in the elementary school curriculum. This initial draft was sent to elementary school subject matter specialists for review. The draft was revised by ETS staff on the basis of the specialists' suggestions and then sent to an external review panel, which consisted of practicing professionals familiar with elementary school teaching. Telephone interviews were held with each member of the external review panel to solicit suggestions for revisions of the draft inventory. A national advisory committee, which included elementary school teachers, teacher educators, and school and state administrators, met to further review and refine the draft. The final version of the inventory of Education in the Elementary School: Form 1 was administered to a national group of elementary school teachers, teacher educators, and administrators. Analyses were conducted to identify the most important knowledge judged necessary for newly licensed elementary school teachers.

Modifying the Form 1 inventory for the transportability study. To make the Form 1 inventory, which had been developed for elementary school teachers, more appropriate for use in evaluating the importance of the multidisciplinary content for newly licensed secondary school teachers, ETS staff revised the inventory. The following changes were made:

- Introductory statements, directions, and the rating scale were reworded to ask the recipients to relate each statement to what they believed an entry-level secondary school teacher should know.
- The domain heading "Knowledge of Elementary School Students" was renamed "Knowledge of Students."
- The "Knowledge of Professional Issues" domain was deleted because it was not considered one of the multidisciplinary subject areas and would not become part of a new test of multiple subjects.
- The domain headings in Part IV--Recommendations for Test Content--were reworded to reflect the changes noted above.
- Each of the questions on importance of the individual domains (e.g., Knowledge of Science, Knowledge of Social Studies) was reworded to specify secondary school teachers.
- Finally, the inventory was renamed (Inventory of Knowledge of General Subjects) and printed with a different colored cover to make it visibly different from the Form 1 inventory.

There were no changes made in the individual statements within domains, even though ETS staff felt some statements were inappropriate for secondary school teachers (e.g., knowledge of children's literature). The intent was not to tailor the content to secondary school teachers; rather, it was to see if the general subjects described for elementary school

teachers were also judged to be important for secondary school teachers. Therefore, the only changes made in the inventory were designed to make it appropriate for secondary school teachers to complete.

Final survey format. The Inventory of Knowledge of General Subjects is found in Appendix A. The inventory included the following sections:

- Part I was the introduction, which described the inventory's purpose and gave directions for completing the inventory.
- Part II contained eight knowledge domains and their respective knowledge statements:

Knowledge of Students;  
Knowledge of Reading, Language Arts, and Literature;  
Knowledge of Mathematics;  
Knowledge of Social Studies;  
Knowledge of Science;  
Knowledge of Physical Education;  
Knowledge of Health; and  
Knowledge of Visual and Performing Arts.

A total of 140 knowledge statements was included in Part II; there were also a content coverage question and an overall domain importance question for each knowledge domain, bringing the total number of questions to 156. Part II also contained the rating scale used for determining the importance of each knowledge statement for newly licensed secondary school teachers.

- Part III asked respondents to list any important knowledge domains they believed were not included in the inventory.
- Part IV asked respondents to allocate 100 points across domains covered in the inventory to show how much emphasis they believed should be placed on each domain in the resulting test. These ratings are used to help assist test development committees in deciding how many test questions to put in each relevant knowledge domain.
- Part V asked respondents to complete background information questions (e.g., school level taught, school setting, sex); responses to these questions were used to characterize the survey respondents and, where appropriate, to conduct subgroup analyses.

The major differences between the Inventory of Knowledge of General Subjects and the Education in the Elementary School: Form 1 inventory were: the wording of the introduction, directions, and rating scale to specify secondary school teachers; the deletion of a domain (Knowledge of Professional Issues) judged unimportant for the development of a multi-subjects test; and the overall reduction in the number of inventory statements, which resulted from the deletion of the Knowledge of Professional Issues domain.

#### Evaluating the Domain of General Subjects for its Importance to Newly Licensed Secondary School Teachers

The multidisciplinary subjects detailed in the Inventory of Knowledge of General Subjects were evaluated in terms of their importance for competent job performance by the newly licensed secondary school teacher. The evaluation was carried out in two steps: 1) an administration of the inventory to a large group of secondary school teachers; and 2) an analysis of the importance ratings obtained from this administration.

Administration of the inventory. The Inventory of Knowledge of General Subjects was mailed with an accompanying cover letter (Appendix B) and post-paid return envelope

to 5,100 secondary school classroom teachers. The names of 50 middle school and 50 high school teachers were drawn at random from each state plus the District of Columbia from mailing lists obtained through Market Data Retrieval Services (MDRS). MDRS is a survey research organization whose data base contains the names of over 90% of all the public school teachers in the United States. Two weeks after the initial mailing, a follow-up postcard was sent requesting completion of the inventory (see Appendix C).

**Data analysis.** Three types of analyses were conducted: (1) frequencies of responses to the background information questions (e.g., age, number of years of teaching experience, race/ethnicity); (2) mean importance ratings by relevant subgroups of respondents (e.g., middle school teachers, secondary school teachers, females); and (3) correlations of mean importance ratings within relevant subgroups.

**Frequencies of responses to the background information questions** were computed to describe the group of educators who responded to the survey. Five of these background questions, in particular, were important for purposes of analyzing the data of this study: geographic location; sex; race/ethnicity; school level; and years of teaching experience. Geographic location was considered relevant in order to determine if educators from different areas of the country had similar perceptions. The four geographic regions (South, Far West, Northeast, Central)<sup>2</sup> used in the analysis are consistent with the categories used by the National Association of State Directors of Teacher Education and Certification (NASDTEC). Sex and race/ethnicity were considered relevant subgroups because they represent protected "classes" under Title VII of the Civil Rights Act of 1964. School level taught (middle, secondary) was considered important to determine if respondents' perceptions were similar regardless of school level taught. Years of teaching experience was included to determine if perceptions of importance differed by years of teaching experience. An analysis by relevant subgroups is an important part of the data analysis, for it is used to determine a core of knowledge that all relevant subgroups agree is important for the newly licensed (certified) secondary school teacher.

**Mean importance ratings** were computed for each statement by relevant subgroups that numbered 30 or more--this number is necessary to ensure an accurate estimate of the population mean (Walpole, 1974). The comparison of mean ratings provides an absolute measure of importance attributed to the knowledge statements by the various subgroups (e.g., teachers, teacher educators, females). Knowledge statements that meet or go beyond a critical mean value (discussed later in the report) by all relevant subgroups of respondents may be considered for inclusion in the development of test specifications. Means were also computed for responses to the content coverage and the recommendations for test content sections of the inventory. These mean analyses were computed using the aggregate of the respondents to provide overall indicators of relevance for consideration by test development staff.

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<sup>2</sup>The geographic regions are those used by the National Association of State Directors of Teacher Education and Certification (NASDTEC). The states within these regions are:

South--Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia;

Far West--Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming;

Northeast--Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; and

Central--Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Wisconsin.

**Correlation coefficients** were computed to determine the extent to which subgroups had similar patterns of mean importance ratings across the knowledge statements. Similar patterns reflect agreement in the relative importance of each knowledge statement. For example, the profile of the 140 mean importance ratings for males was correlated with the profile of the 140 mean importance ratings for females. The greater the similarity between the two profiles, the closer the correlation coefficient value will be to 1.0.

Criteria for selecting content for purposes of test development. To aid the test development staff in determining which knowledge areas should be considered for purposes of defining the content domain for a test of multi-subjects and which knowledge areas should not be included, a mean rating of 2.50 was chosen as a cutpoint. The mean of 2.50 is the midpoint between *Moderately Important* and *Important* on the 5-point rating scale and is consistent with the intent of content validity, which is to include important knowledge and exclude unimportant knowledge from the assessment measures. The rating scale is shown in Table 1.

Table 1. Rating Scale Used in the Inventory

|                                                                                                                                                                                                                       |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Regardless of subject matter or grade level taught, how <u>important</u> is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner? |                      |
| (0)                                                                                                                                                                                                                   | Not important        |
| (1)                                                                                                                                                                                                                   | Slightly important   |
| (2)                                                                                                                                                                                                                   | Moderately important |
| (3)                                                                                                                                                                                                                   | Important            |
| (4)                                                                                                                                                                                                                   | Very important       |

Members of the test development staff were advised to consider knowledge areas that received a mean importance rating of 2.50 or higher as eligible for inclusion in the test specifications; knowledge areas that fell below the 2.50 cutpoint were not to be considered for inclusion. If the test development staff wished to include a knowledge area that did not meet the cutpoint, they were requested to provide a compelling and documented rationale for its inclusion.

## Results

### Response Rate

Of the 5,100 Form 1 surveys mailed out, 34 were returned not completed due to a variety of reasons (e.g., incorrect address, individual had retired, individual declined to participate). Of the remaining 5,066, 1,650 were completed and returned. Of these 1,650 surveys, 1,263 were analyzed; those that were not analyzed either had been returned after the due date (n=49) or the respondents did not meet the criteria of being a teacher/full-time substitute in a middle/junior high or secondary/high school (n=338). The overall response rate (including nonusable surveys) was 33% (n=1,684).

### Demographic Characteristics of Respondents

Appendix D shows the distribution of teachers across all the background information categories. There was a relatively equal distribution across geographic regions: 27% from the Central region of the country; 25% from the South; 23% from the Northeast; and 25% from the Far West. Fifty-eight percent were female; 42% were male. The majority of the respondents were White (89%); 5% were African-American; and the remaining 6% were other people of color. Fifty-two percent were middle/junior high school teachers; 48% were secondary/high school teachers. Three percent had two years of teaching experience or less; 96% had taught three years or more.

### Mean Importance Ratings of Knowledge Statements

The mean importance rating on each knowledge statement for all respondents is found in Appendix E. Knowledge statements rated less than 2.50 are identified in boldface on this table. Mean importance ratings were also computed for each of the relevant subgroups of respondents. Appendix F displays the knowledge statements that did not meet the 2.50 cutpoint for relevant subgroups of respondents.

Of the 140 knowledge statements on the inventory, 56 statements (40%) fell below the 2.50 cutpoint for one or more relevant subgroups. Fifty-two of these statements were rated below 2.50 by respondents by school level; an additional four statements were rated below 2.50 by the analyses of other relevant subgroup of respondents (e.g., female, less than two years of teaching experience). Table 2 shows the total number and percent of statements that fell below 2.50 in each domain. For 22 knowledge statements (16% of the total knowledge statements), one or more subgroups gave ratings of less than 2.00 (*Moderately Important*).

Table 2. Number and Percent of Statements below 2.50 by Domain

| KNOWLEDGE DOMAIN                          | NUMBER OF<br>STATEMENTS<br>IN THE<br>DOMAIN | STATEMENTS<br>RATED BELOW 2.50 |                             |
|-------------------------------------------|---------------------------------------------|--------------------------------|-----------------------------|
|                                           |                                             | number                         | percent of<br>the<br>domain |
| Students                                  | 15                                          | 5                              | 33%                         |
| Reading, Language Arts, and<br>Literature | 16                                          | 3                              | 19%                         |
| Mathematics                               | 24                                          | 8                              | 33%                         |
| Social Studies                            | 30                                          | 8                              | 27%                         |
| Science                                   | 27                                          | 15                             | 56%                         |
| Physical Education                        | 2                                           | 2                              | 100%                        |
| Health                                    | 11                                          | 0                              | 0%                          |
| Visual and Performing Arts                | 15                                          | 15                             | 100%                        |

Substantial portions of the domain were judged to be important in the following knowledge categories: students; reading, language arts, and literature; mathematics; social studies; and health. More than half of the content areas included in science, physical education, and visual and performing arts did not meet the 2.50 standard for one or more of the relevant subgroups.

### Correlations of Mean Importance Ratings by Relevant Subgroups

Correlation coefficients were computed between relevant subgroups numbering at least 30 to assess the extent of similarity in ratings among relevant subgroups of respondents. The correlation between females (n=735) and males (n=524) was .98. Between teachers with two or fewer years of teaching experience (n=41) and teachers with three or more years of teaching experience (n=1219), the correlation was .97. The correlations for geographic region are shown in Table 3. The correlations between ethnicities are shown in Table 4. Correlations for teachers by school level are shown in Table 5. All of the correlations were above .94, indicating a high level of agreement in perceived relative importance of the knowledge statements among the various subgroups.

Table 3. Correlations by Geographic Region

|                  | <b>SOUTH</b><br>n=313 | <b>CENTRAL</b><br>n=344 | <b>NORTHEAST</b><br>n=287 | <b>FAR WEST</b><br>n=312 |
|------------------|-----------------------|-------------------------|---------------------------|--------------------------|
| <b>SOUTH</b>     | 1.00                  |                         |                           |                          |
| <b>CENTRAL</b>   | .99                   | 1.00                    |                           |                          |
| <b>NORTHEAST</b> | .99                   | .99                     | 1.00                      |                          |
| <b>FAR WEST</b>  | .99                   | .99                     | .99                       | 1.00                     |

Table 4. Correlations by Race/Ethnicity

|                              | <b>WHITE</b><br>n=1113 | <b>AFRICAN-AMERICAN</b><br>n=58 | <b>OTHER PEOPLE OF COLOR<sup>3</sup></b><br>n=79 |
|------------------------------|------------------------|---------------------------------|--------------------------------------------------|
| <b>WHITE</b>                 | 1.00                   |                                 |                                                  |
| <b>AFRICAN-AMERICAN</b>      | .94                    | 1.00                            |                                                  |
| <b>OTHER PEOPLE OF COLOR</b> | .98                    | .95                             | 1.00                                             |

<sup>3</sup>Race/ethnicity was broken into three groups (African-American, White, Other People of Color) because of the small numbers of respondents representing each of the non-White and non-African-American races/ethnicities. "Other People of Color" includes Asian/Asian Americans, American Indians, Mexican Americans, Puerto Ricans, Latin Americans, and those who consider themselves combinations of ethnicity or an ethnicity not included among the possible answer choices for this question. Results are not reported for individual ethnic groups because the number of respondents in each group was less than 30.

Table 5. Correlations by School Level

|           | MIDDLE<br>n=593 | SECONDARY<br>n=545 | BOTH <sup>4</sup><br>n=125 |
|-----------|-----------------|--------------------|----------------------------|
| MIDDLE    | 1.00            |                    |                            |
| SECONDARY | .98             | 1.00               |                            |
| BOTH      | .99             | .99                | 1.00                       |

Together, the results of the mean and correlational analyses suggest strong support for a core of important knowledge that is relevant for secondary school teachers. As discussed earlier, test development staff are advised to consider for inclusion in the development of test specifications only those knowledge statements that received a mean importance rating of 2.50 or greater. To include knowledge statements that fall below the cutpoint, test development staff are requested to provide compelling written justification.

#### Evaluation of the Content Domain

Respondents were asked two questions on the inventory to determine the extent to which the inventory covered knowledge judged to be important for the newly licensed secondary school teacher: a question on content coverage and a question on the overall importance of each knowledge domain.

**Content coverage.** Survey respondents were asked to indicate, using a 5-point rating scale, how well each major knowledge domain was covered by the specific knowledge statements. The scale values ranged from a low of 1 (*Very Poorly*) to a high of 5 (*Very Well*); the midpoint of the scale was a value of 3 (*Adequately*). Table 6 shows the means and standard deviations of these ratings. All the mean ratings were above 3.50 except for the rating teachers gave to the section on Knowledge of Physical Education (3.43). Most of the ratings were around 4.00. This analysis indicates that respondents judged the knowledge domains to be adequately to well-covered.

Table 6. Content Coverage of Knowledge Domains

| KNOWLEDGE DOMAIN                       | MEAN<br>n=1182-1191 <sup>5</sup> | STANDARD<br>DEVIATION |
|----------------------------------------|----------------------------------|-----------------------|
| Students                               | 3.63                             | .82                   |
| Reading, Language Arts, and Literature | 4.06                             | .77                   |
| Mathematics                            | 4.05                             | .75                   |
| Social Studies                         | 3.97                             | .77                   |
| Science                                | 3.98                             | .78                   |
| Physical Education                     | 3.43                             | .91                   |
| Health                                 | 4.12                             | .78                   |
| Visual and Performing Arts             | 3.76                             | .79                   |

<sup>4</sup>"Both" includes teachers who teach in both middle and secondary schools, such as music and art teachers.

<sup>5</sup>The number of teachers who answered each question varied across questions.

Mean ratings for the overall importance of the knowledge domains. Respondents were asked to give ratings for the overall importance of each knowledge domain. The scale values for this question ranged from a low of 0 (*Not Important*) to a high of 4 (*Very Important*); the midpoint of the scale was a value of 2 (*Moderately Important*). As seen in Table 7, when the means are rounded, all of the domains except for one (Knowledge of Visual and Performing Arts) were rated as being important for newly licensed secondary school teachers. The domain of Knowledge of Visual and Performing Arts was judged to be moderately important.

Table 7. Mean Importance Ratings of Knowledge Domains

| KNOWLEDGE DOMAIN                       | MEAN<br>n=1182-1191 | STANDARD<br>DEVIATION |
|----------------------------------------|---------------------|-----------------------|
| Students                               | 2.83                | .89                   |
| Reading, Language Arts, and Literature | 3.27                | .67                   |
| Mathematics                            | 3.04                | .77                   |
| Social Studies                         | 2.89                | .75                   |
| Science                                | 2.84                | .81                   |
| Physical Education                     | 2.46                | .98                   |
| Health                                 | 3.38                | .66                   |
| Visual and Performing Arts             | 2.02                | .98                   |

Mean Percentage Weights for Test Content Emphasis: Aggregate of Survey Respondents

In addition to being asked to rate each knowledge statement, respondents were asked to indicate how many test questions (out of 100) should be included from each of the knowledge domains. Table 8 shows the mean percentage weights allocated by each job category of respondents and the corresponding standard deviations. Overall, Knowledge of Students received the highest rating (19.03%). Knowledge of Physical Education (6.47%) and Knowledge of Visual and Performing Arts (6.10%) received the lowest number of percentage points. Given the fact that all of the individual knowledge statements within these two domains were rated below the cutpoint for importance, neither of the domains should be included in test specifications for a test of multiple subjects. As they set the final test specifications, test development staff should consider the weightings given by respondents.

Table 8. Mean Percentage Weights for Test Content Emphasis<sup>6</sup>

| KNOWLEDGE<br>DOMAIN                          | MEAN<br><br>n=1182-1191 | STANDARD<br>DEVIATION |
|----------------------------------------------|-------------------------|-----------------------|
| Students                                     | 19.03                   | 10.92                 |
| Reading, Language<br>Arts, and<br>Literature | 17.69                   | 7.37                  |
| Mathematics                                  | 14.64                   | 5.86                  |
| Social Studies                               | 12.91                   | 5.27                  |
| Science                                      | 12.74                   | 6.10                  |
| Physical Education                           | 6.47                    | 3.86                  |
| Health                                       | 11.27                   | 5.95                  |
| Visual and<br>Performing Arts                | 6.10                    | 5.63                  |

### Summary

A transportability study was conducted to determine if the multidisciplinary knowledge necessary for elementary school teachers was also relevant for newly licensed (certified) secondary school teachers. The results of the study may be used to explore the possibility of developing a test of multiple subjects for all teachers, regardless of subject matter or school level taught. The report presents the methods used to create the Inventory of Knowledge of General Subjects, describes the statistical analyses conducted, and offers conclusions regarding the relevance of the multidisciplinary content for newly licensed secondary school teachers.

Form 1 of the Education in the Elementary School job analysis inventory was modified by ETS staff to make it appropriate for administration to a national group of secondary school teachers. The purpose of the transportability study was to determine how relevant the multidisciplinary knowledge covered in the inventory is for secondary school teachers. The revised knowledge inventory (Knowledge of General Subjects) was sent in survey form to 5100 secondary school teachers across the United States. Respondents were asked to rate the individual knowledge statements using a 5-point importance scale.

Three types of analyses were conducted: (1) frequency distributions across background information categories (e.g., sex, years of teaching experience, school level); (2) mean importance ratings by relevant subgroups; and (3) correlations of mean importance ratings within relevant subgroups. A cutpoint of 2.50 (midway between *Moderately Important* and *Important*) was set to differentiate between important knowledge and unimportant knowledge for consideration in a test of multiple subjects. Knowledge statements that received a mean rating of less than 2.50 by any of the relevant subgroups of respondents (school level; geographic region; sex; race/ethnicity; years of teaching experience) were identified. Test development staff were advised to use knowledge statements that were rated above the 2.50 cutpoint for consideration in developing a test of

<sup>6</sup>Rounded, the sum of percentages may not equal 100 because some respondents wrote in totals that were greater than or less than 100.

multiple subjects. However, if test development staff determined that the inclusion of particular knowledge statements that fell below 2.50 was necessary, then they were requested to provide a written and compelling rationale for the inclusion of the statements.

Fifty-six knowledge statements (40%) proved problematic to one or more of the designated subgroups, that is, one or more subgroups rated the statement below the cutpoint of 2.50. These knowledge statements are shown in Table 9. Before they may be used in test specifications, these knowledge areas need written rationales from the test development staff. Without qualifications, 60% (n=84) of the knowledge areas may be used to develop specifications for a test of general subjects.

Table 9. Knowledge Statements that Failed to Meet the 2.50 Cutpoint

|                                                                      |                                                                  |
|----------------------------------------------------------------------|------------------------------------------------------------------|
| <b>DOMAIN A: KNOWLEDGE OF STUDENTS</b>                               |                                                                  |
| 11                                                                   | theories of language development                                 |
| 12                                                                   | early language acquisition's affect on classroom language        |
| 13                                                                   | stages of language acquisition and development                   |
| 14                                                                   | second language learning                                         |
| 15                                                                   | principles of linguistics                                        |
| <b>DOMAIN B: KNOWLEDGE OF READING, LANGUAGE ARTS, AND LITERATURE</b> |                                                                  |
| 26                                                                   | children's literature                                            |
| 27                                                                   | adult literature                                                 |
| 31                                                                   | creative dramatics                                               |
| <b>DOMAIN C: KNOWLEDGE OF MATHEMATICS</b>                            |                                                                  |
| 36                                                                   | prenumeration                                                    |
| 38                                                                   | number theory                                                    |
| 39                                                                   | patterns and functions                                           |
| 49                                                                   | inequalities                                                     |
| 50                                                                   | integers                                                         |
| 51                                                                   | geometry and spatial sense                                       |
| 55                                                                   | statistics and probability                                       |
| 59                                                                   | historical, cultural, and ongoing development of math principles |
| <b>DOMAIN D: KNOWLEDGE OF SOCIAL STUDIES</b>                         |                                                                  |
| 72                                                                   | traditional political institutions                               |
| 77                                                                   | individual and the market                                        |
| 79                                                                   | government and the market                                        |
| 83                                                                   | belief systems in various cultures                               |
| 84                                                                   | socialization and acculturation                                  |
| 87                                                                   | impact of cultural evolution on different civilizations          |
| 88                                                                   | physical anthropology                                            |
| 91                                                                   | philosophical traditions in diverse cultures                     |

(Table 9 continues on the following page.)

**DOMAIN E: KNOWLEDGE OF SCIENCE**

- 94 molecules, atoms, and chemical change
- 95 physical change
- 97 sound
- 98 light
- 100 transformation of energy
- 101 machines
- 102 magnetism and electricity
- 103 flight and space travel
- 106 sun and planets
- 107 stars and the universe
- 108 history of the earth, solar system, and universe
- 109 origins of life
- 110 classification system
- 112 relationships of structure and functions
- 118 unifying themes/concepts in science

**DOMAIN F: KNOWLEDGE OF PHYSICAL EDUCATION**

- 123 basic elements and components of physical education
- 124 progression of motor learning

**DOMAIN H: KNOWLEDGE OF VISUAL AND PERFORMING ARTS**

- 140 basic elements of music
- 141 genres of music
- 142 various music media
- 143 basic elements of visual arts
- 144 genres of visual arts
- 145 various visual arts media
- 146 basic elements of dance
- 147 genres of dance
- 148 basic elements and components of drama
- 149 genres of drama
- 150 elements common to the arts
- 151 human need for expression through the arts
- 152 the affective influence of a work of art on the viewer, listener, perceiver
- 153 works of music, dance, drama, and the visual arts across cultures
- 154 works of music, dance, drama, and the visual arts, from various periods of history

The 84 knowledge statements that were identified to be important by the surveyed teachers and teacher educators should be used as the foundation for the development of test specifications. It is reasonable to assume that, due to testing and psychometric constraints (e.g., time limits, ability to measure some content reliably), not all of the identified content may be included on assessment measures. One source of information that may be used to guide test development staff in their decision of what content to include on the assessment measures is the mean importance rating. Although a rank ordering of the content by mean importance rating is not implied, it is recommended that initial consideration be given to content that is well above the cutpoint and represents the appropriate breadth of content coverage. Should test development staff find it necessary to use content rated below the cutpoint, then they should provide a written and compelling rationale for the use of such content.

Correlations for relevant subgroups were .94 and above, which suggests that there is substantial agreement among various subgroups of teachers with respect to the relative importance of the multidisciplinary knowledge needed by newly licensed secondary school teachers.

Evidence was also provided in this study of how well each domain was covered by the specific knowledge statements and the overall importance of each knowledge domain. The results suggest that all of the domains were either adequately or well covered by the specific knowledge statements. Additionally, results indicate that all of the knowledge domains were judged to be at least moderately important for the newly licensed secondary school teacher. Finally, suggestions were offered regarding the relative weights each domain should receive in test specifications for an assessment of multiple subjects for secondary school teachers.

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## Appendix A

### Inventory of Knowledge of General Subjects

# **INVENTORY OF KNOWLEDGE OF GENERAL SUBJECTS**

By

**Educational Testing Service  
Princeton, New Jersey**

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## PART I -- INTRODUCTION

Educational Testing Service (ETS) is developing a new generation of assessments for the purpose of licensing (certifying) teachers. The inventory that follows is part of our development effort and is designed to gather information concerning the knowledge of general subjects that may be important for all teachers, regardless of the grade level or subject matter taught.

The inventory asks you to respond to a list of knowledge statements and to rate each statement as to its importance for a newly licensed (certified) teacher. Please do not relate each statement to your own job but rather to what you believe an entry-level secondary school teacher should know.

The information you provide will guide the development of a test that covers knowledge of general subjects that all teachers need, regardless of subject matter or grade level taught. In addition to the development of a new examination, this study will also contribute to our understanding of education as a profession. We expect the results of the study to be widely disseminated and to have ramifications for teacher preparation.

The inventory has been mailed to a sample of approximately 5000 secondary school teachers. The value of the results is directly related to the number of individuals who return their completed inventories. Because you represent a large number of professionals, your responses are extremely important. Please take the time to complete and return the inventory. Thank you.

## PART II – INVENTORY OF KNOWLEDGE OF GENERAL SUBJECTS

This section focuses on the knowledge of students and subject matter that all secondary school teachers draw on as they perform their work. On the following pages you will find eight broad domains:

- A. Knowledge of Students
- B. Knowledge of Reading, Language Arts, and Literature
- C. Knowledge of Mathematics
- D. Knowledge of Social Studies
- E. Knowledge of Science
- F. Knowledge of Physical Education
- G. Knowledge of Health
- H. Knowledge of Visual and Performing Arts

Within each domain is a list of topics. For each topic you will be asked to make your judgment using the following scale:

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

To familiarize yourself with the domains and topics, you may wish to glance through the inventory before making your rating judgments. Please note that many topics are followed by examples (e.g.) or clarifying statements (i.e.). These items are included in parentheses in order to assist you; they are not meant to be read as sample test items.

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

#### A. KNOWLEDGE OF STUDENTS

#### IMPORTANCE

*The following statements refer to knowledge of human growth, development, and learning of all students that a secondary school teacher needs, regardless of subject matter or grade level taught.*

**Understand the physical, psychosocial, and cognitive factors that influence growth, development, and learning**

- |                                                                                                                                                                                             |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1. Biological (e.g., genetic maturation) .....                                                                                                                                              | 0 | 1 | 2 | 3 | 4 |
| 2. Familial (e.g., parental child-rearing attitudes, sibling relationships, birth order, single-parent families, socio-economic level) .....                                                | 0 | 1 | 2 | 3 | 4 |
| 3. Nutritional/hygienic (e.g., the effects of diet and eating behaviors, sleep patterns, exercise, immunization) .....                                                                      | 0 | 1 | 2 | 3 | 4 |
| 4. Cultural (e.g., gender roles; the effects of the dominant cultural values; the effects of regional, ethnic, and religious influences; the role of primary transmitters of culture) ..... | 0 | 1 | 2 | 3 | 4 |
| 5. Educational context (e.g., student, parent, and teacher expectations; school climate; out of school context; community impact) .....                                                     | 0 | 1 | 2 | 3 | 4 |
| 6. Students' learning styles (e.g., visual, auditory, field dependent/independent kinesthetic) .....                                                                                        | 0 | 1 | 2 | 3 | 4 |

**Understand theories of cognitive, physical, and psychosocial development from prenatal through adolescence stages**

- |                                                                                                                                     |   |   |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 7. Cognitive development (e.g., logical reasoning, perceptual, causal reasoning, information processing, constructivism) .....      | 0 | 1 | 2 | 3 | 4 |
| 8. Physical development (e.g., gross and fine motor development, visual discrimination, auditory discrimination, kinesiology) ..... | 0 | 1 | 2 | 3 | 4 |
| 9. Affective development (e.g., self-concept and self-esteem, motivation to learn) .....                                            | 0 | 1 | 2 | 3 | 4 |
| 10. Social development (e.g., social conventions and social judgments, play behavior) .....                                         | 0 | 1 | 2 | 3 | 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**A. KNOWLEDGE OF STUDENTS (cont.)**

**IMPORTANCE**

Understand the nature of language development from prenatal through adolescence stages

- |                                                                                                                                                                           |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 11. Theories of language development (e.g., Bruner, Vygotsky, Skinner, Chomsky) .....                                                                                     | 0 | 1 | 2 | 3 | 4 |
| 12. How early language acquisition can affect the development of language in the classroom .....                                                                          | 0 | 1 | 2 | 3 | 4 |
| 13. Stages of language acquisition and development (e.g., phonology, syntax, semantics, conventions of print, conventions of language) .....                              | 0 | 1 | 2 | 3 | 4 |
| 14. Second language learning (i.e., the cross-cultural nature of second language learning and the importance and impact of dialects and familial language patterns) ..... | 0 | 1 | 2 | 3 | 4 |
| 15. Principles of linguistics, psycholinguistics, sociolinguistics (e.g., various language structures, effects of prior knowledge, standard/nonstandard dialects) .....   | 0 | 1 | 2 | 3 | 4 |
| 16. Overall evaluation of the importance of Knowledge of Students? .....                                                                                                  | 0 | 1 | 2 | 3 | 4 |

17. How well do the statements in section A cover the important aspects of Knowledge of Students necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

---



---

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

*The following sections (B-H) refer to the knowledge of general subjects that a secondary school teacher needs, regardless of subject matter or grade level taught.*

*NOTE: The examples given are not all inclusive.*

| B. <u>KNOWLEDGE OF READING, LANGUAGE ARTS, AND LITERATURE</u>                                                                                                    | <u>IMPORTANCE</u> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 18. Conventions of language (e.g., spelling, capitalization, punctuation, handwriting) .....                                                                     | 0 1 2 3 4         |
| 19. Language structure (e.g., parts of speech, verb tenses, plurals, figurative language, sentence types) .....                                                  | 0 1 2 3 4         |
| 20. Word recognition strategies (e.g., sight vocabulary, phonic analysis, structural analysis) .....                                                             | 0 1 2 3 4         |
| 21. Comprehension strategies (e.g., text structure, vocabulary, and metacognitive strategies; activating prior knowledge) .....                                  | 0 1 2 3 4         |
| 22. Text structure (e.g., expository text, narrative text, organizational patterns, vocabulary and concept load) .....                                           | 0 1 2 3 4         |
| 23. Language usage (e.g., interpretive and communicative aspects, requesting, questioning, nonverbal communication) .....                                        | 0 1 2 3 4         |
| 24. Library skills (e.g., catalogue and search systems, reference materials) ...                                                                                 | 0 1 2 3 4         |
| 25. Study skills (e.g., note taking, organizing materials and time, planning, outlining, dictionary usage, issues in reading in the content areas) .....         | 0 1 2 3 4         |
| 26. Children's literature (e.g., the range of nonfiction and fiction, poetry, drama, myths, multicultural literature, Caldecott and Newbery award winners) ..... | 0 1 2 3 4         |
| 27. Adult literature (e.g., various genres of fiction and nonfiction, Western and non-Western authors) .....                                                     | 0 1 2 3 4         |
| 28. Functional literacy (e.g., documents, advertisements, newspapers, magazines) .....                                                                           | 0 1 2 3 4         |
| 29. Graphic literacy (e.g., illustrations, photographs, charts, media) .....                                                                                     | 0 1 2 3 4         |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**B. KNOWLEDGE OF READING, LANGUAGE ARTS, AND LITERATURE (cont.)      IMPORTANCE**

- |                                                                                                                                                                                                                                 |   |   |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 30. Oral communication and presentation skills (e.g., voice modulation, public speaking, storytelling, leading group discussions) .....                                                                                         | 0 | 1 | 2 | 3 | 4 |
| 31. Creative dramatics (e.g., spontaneous dramatics, role playing, puppetry, play production) .....                                                                                                                             | 0 | 1 | 2 | 3 | 4 |
| 32. Composing processes (i.e., prewriting/planning, drafting, revising, editing, publishing) .....                                                                                                                              | 0 | 1 | 2 | 3 | 4 |
| 33. Types of writing (e.g., expressive, personal, informational, poetic, imaginative) .....                                                                                                                                     | 0 | 1 | 2 | 3 | 4 |
| 34. Overall evaluation of the importance of Knowledge of Reading, Language Arts, and Literature? .....                                                                                                                          | 0 | 1 | 2 | 3 | 4 |
| 35. How well do the statements in section B cover the important aspects of Knowledge of Reading, Language Arts, and Literature necessary for all secondary school teachers, regardless of subject matter or grade level taught? |   |   |   |   |   |

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

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---

**C. KNOWLEDGE OF MATHEMATICS      IMPORTANCE**

Mathematical concepts and how to use them

- |                                                                                      |   |   |   |   |   |
|--------------------------------------------------------------------------------------|---|---|---|---|---|
| 36. Preenumeration (e.g., classification, patterns, sets) .....                      | 0 | 1 | 2 | 3 | 4 |
| 37. Numeration (e.g., place value, cardinal and ordinal numbers, number bases) ..... | 0 | 1 | 2 | 3 | 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

| <b>C. KNOWLEDGE OF MATHEMATICS (cont.)</b>                                                                                                                     | <b>IMPORTANCE</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 38. Number theory (e.g., prime, composite, greatest common factor) . . . . .                                                                                   | 0 1 2 3 4         |
| 39. Patterns and functions . . . . .                                                                                                                           | 0 1 2 3 4         |
| 40. Number sense (i.e., number meaning and use, operation sense) . . . . .                                                                                     | 0 1 2 3 4         |
| 41. Techniques for computational estimation . . . . .                                                                                                          | 0 1 2 3 4         |
| 42. Mental mathematics . . . . .                                                                                                                               | 0 1 2 3 4         |
| 43. Calculator . . . . .                                                                                                                                       | 0 1 2 3 4         |
| 44. Computer . . . . .                                                                                                                                         | 0 1 2 3 4         |
| 45. Paper/pencil computation . . . . .                                                                                                                         | 0 1 2 3 4         |
| 46. Whole numbers . . . . .                                                                                                                                    | 0 1 2 3 4         |
| 47. Rational numbers (fractions, decimals) . . . . .                                                                                                           | 0 1 2 3 4         |
| 48. Percents . . . . .                                                                                                                                         | 0 1 2 3 4         |
| 49. Inequalities . . . . .                                                                                                                                     | 0 1 2 3 4         |
| 50. Integers . . . . .                                                                                                                                         | 0 1 2 3 4         |
| 51. Geometry and spatial sense (e.g., area and perimeter, square and cube, symmetry, congruence) . . . . .                                                     | 0 1 2 3 4         |
| 52. Measurements to describe and compare phenomena (e.g., length, capacity, weight, area, volume, time, temperature, angle measure, perimeter, mass) . . . . . | 0 1 2 3 4         |
| 53. Organizing and interpreting data (e.g., tables, charts, graphs) . . . . .                                                                                  | 0 1 2 3 4         |
| 54. Algebraic methods to solve a variety of real world and other mathematical problems . . . . .                                                               | 0 1 2 3 4         |
| 55. Statistics and probability (e.g., measures of central tendency, dispersion, prediction) . . . . .                                                          | 0 1 2 3 4         |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

C. KNOWLEDGE OF MATHEMATICS (cont.)

IMPORTANCE

Mathematical reasoning

- |                                                                                                                                                                                                      |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 56. Methods of using mathematics to make sense of the world (e.g., solving real world problems, seeking patterns, organizing data in useful ways) . . .                                              | 0 | 1 | 2 | 3 | 4 |
| 57. Methods of mathematical investigation (e.g., collaborating with others, applying a variety of strategies and pathways, multiple solutions) . . . . .                                             | 0 | 1 | 2 | 3 | 4 |
| 58. Strategies for problem solving (e.g., acting it out, making a list, drawing a picture, guess and check) . . . . .                                                                                | 0 | 1 | 2 | 3 | 4 |
| 59. Historical, cultural, and ongoing development of major mathematical concepts and principles . . . . .                                                                                            | 0 | 1 | 2 | 3 | 4 |
| 60. Overall evaluation of the importance of Knowledge of Mathematics? . . .                                                                                                                          | 0 | 1 | 2 | 3 | 4 |
|                                                                                                                                                                                                      |   |   |   |   |   |
| 61. How well do the statements in section C cover the important aspects of Knowledge of Mathematics necessary for all secondary school teachers, regardless of subject matter or grade level taught? |   |   |   |   |   |

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

---



---

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**D. KNOWLEDGE OF SOCIAL STUDIES**

**IMPORTANCE**

- |                                                                                                                                                                      |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 62. Methods of inquiry and validation of evidence in social studies (e.g., map skills, graphs, statistical information, reports, simulations, primary sources) ..... | 0 1 2 3 4 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|

**Major concepts in geography**

- |                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| 63. Interdependence of humans and physical environment (e.g., climate, landforms, vegetation) ..... | 0 1 2 3 4 |
| 64. World cultures .....                                                                            | 0 1 2 3 4 |
| 65. National territories (e.g., political and physical boundaries) .....                            | 0 1 2 3 4 |

**Major concepts in history**

- |                                                                                                                                             |           |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 66. Chronology, sequence, change .....                                                                                                      | 0 1 2 3 4 |
| 67. Major events and movements in United States history up to the present .....                                                             | 0 1 2 3 4 |
| 68. Major events and movements in global history (e.g., Renaissance, population migration, space exploration, independence movements) ..... | 0 1 2 3 4 |
| 69. Interregional relationships over time (e.g., economic/historical effects of colonialism, Common Market, OPEC) .....                     | 0 1 2 3 4 |

**Major concepts in political science**

- |                                                                                                              |           |
|--------------------------------------------------------------------------------------------------------------|-----------|
| 70. Nature and purpose of government .....                                                                   | 0 1 2 3 4 |
| 71. Forms of government (e.g., democracy, oligarchy, monarchy) .....                                         | 0 1 2 3 4 |
| 72. Traditional political institutions among diverse cultural groups (e.g., matriarchy, chieftainship) ..... | 0 1 2 3 4 |
| 73. United States Constitution .....                                                                         | 0 1 2 3 4 |
| 74. Rights and responsibilities of citizens (e.g., voting, naturalization process, civil rights) .....       | 0 1 2 3 4 |
| 75. Relations among nations (e.g., alliances, wars, treaties, the United Nations) .....                      | 0 1 2 3 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**D. KNOWLEDGE OF SOCIAL STUDIES (cont.)**

**IMPORTANCE**

**Major concepts in economics**

- |                                                                                                                                              |   |   |   |   |   |
|----------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 76. Market as distribution and information system (e.g., demand, supply, production, inflation, international relations) . . . . .           | 0 | 1 | 2 | 3 | 4 |
| 77. Individual and the market (e.g., employment, labor movement, composition and distribution of income and allocation of resources) . . . . | 0 | 1 | 2 | 3 | 4 |
| 78. Effects of economic and historical forces on human populations and natural resources . . . . .                                           | 0 | 1 | 2 | 3 | 4 |
| 79. Government and the market . . . . .                                                                                                      | 0 | 1 | 2 | 3 | 4 |
| 80. Economic systems (e.g., capitalism, socialism) . . . . .                                                                                 | 0 | 1 | 2 | 3 | 4 |

**Major concepts in anthropology, psychology, and sociology**

- |                                                                                                                                     |   |   |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 81. Culture . . . . .                                                                                                               | 0 | 1 | 2 | 3 | 4 |
| 82. World view (e.g., self, other, relationship between self and other, time, space, causality) . . . . .                           | 0 | 1 | 2 | 3 | 4 |
| 83. Belief systems in various cultures (e.g., major organized religions and traditional practices, child-rearing beliefs) . . . . . | 0 | 1 | 2 | 3 | 4 |
| 84. Socialization and acculturation . . . . .                                                                                       | 0 | 1 | 2 | 3 | 4 |
| 85. Political, social, and economic conditions of ethnic groups in the United States and worldwide . . . . .                        | 0 | 1 | 2 | 3 | 4 |
| 86. Cross-cultural phenomena (e.g., communication, racism, sexism) . . . . .                                                        | 0 | 1 | 2 | 3 | 4 |
| 87. Impact of cultural evolution on different civilizations . . . . .                                                               | 0 | 1 | 2 | 3 | 4 |
| 88. Physical anthropology (e.g., human origins and variations) . . . . .                                                            | 0 | 1 | 2 | 3 | 4 |

**Major concepts in philosophy**

- |                     |   |   |   |   |   |
|---------------------|---|---|---|---|---|
| 89. Logic . . . . . | 0 | 1 | 2 | 3 | 4 |
|---------------------|---|---|---|---|---|

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**D. KNOWLEDGE OF SOCIAL STUDIES (cont.) IMPORTANCE**

- |                                                                                                                  |           |
|------------------------------------------------------------------------------------------------------------------|-----------|
| 90. Ethics .....                                                                                                 | 0 1 2 3 4 |
| 91. Philosophical traditions in diverse cultures (e.g., idealism, pragmatism, yoga, Vedic philosophy, Zen) ..... | 0 1 2 3 4 |
| 92. Overall evaluation of the importance of Knowledge of Social Studies? ..                                      | 0 1 2 3 4 |

93. How well do the statements in section D cover the important aspects of Knowledge of Social Studies necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

**E. KNOWLEDGE OF SCIENCE IMPORTANCE**

**Basic concepts in physical science**

- |                                                 |           |
|-------------------------------------------------|-----------|
| 94. Molecules, atoms, and chemical change ..... | 0 1 2 3 4 |
| 95. Physical change .....                       | 0 1 2 3 4 |
| 96. Heat and temperature .....                  | 0 1 2 3 4 |
| 97. Sound .....                                 | 0 1 2 3 4 |
| 98. Light .....                                 | 0 1 2 3 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**E. KNOWLEDGE OF SCIENCE (cont.)**

**IMPORTANCE**

|                                                                                                           |   |   |   |   |   |
|-----------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 99. Energy sources .....                                                                                  | 0 | 1 | 2 | 3 | 4 |
| 100. Transformation of energy .....                                                                       | 0 | 1 | 2 | 3 | 4 |
| 101. Machines .....                                                                                       | 0 | 1 | 2 | 3 | 4 |
| 102. Magnetism and electricity .....                                                                      | 0 | 1 | 2 | 3 | 4 |
| 103. Flight and space travel .....                                                                        | 0 | 1 | 2 | 3 | 4 |
| <b>Basic concepts in earth science</b>                                                                    |   |   |   |   |   |
| 104. Surface features of the earth and changes in these features (e.g., erosion, mountain building) ..... | 0 | 1 | 2 | 3 | 4 |
| 105. Air and weather .....                                                                                | 0 | 1 | 2 | 3 | 4 |
| 106. Sun and planets .....                                                                                | 0 | 1 | 2 | 3 | 4 |
| 107. Stars and the universe .....                                                                         | 0 | 1 | 2 | 3 | 4 |
| 108. History of the earth, solar system, and universe .....                                               | 0 | 1 | 2 | 3 | 4 |
| <b>Basic concepts in life science and ecology (plants and animals)</b>                                    |   |   |   |   |   |
| 109. Origins of life .....                                                                                | 0 | 1 | 2 | 3 | 4 |
| 110. Classification systems .....                                                                         | 0 | 1 | 2 | 3 | 4 |
| 111. Human anatomy and physiology .....                                                                   | 0 | 1 | 2 | 3 | 4 |
| 112. Relationships of structure and functions .....                                                       | 0 | 1 | 2 | 3 | 4 |
| 113. Reproduction and nurturing of the young .....                                                        | 0 | 1 | 2 | 3 | 4 |
| 114. Habitat and climate, including adaptation and population dynamics .....                              | 0 | 1 | 2 | 3 | 4 |
| 115. Food chains and interdependence .....                                                                | 0 | 1 | 2 | 3 | 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**E. KNOWLEDGE OF SCIENCE (cont.)**

**IMPORTANCE**

**Inquiry in science**

- |                                                                                                                                                                                                |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 116. Scientific processes and problem solving (e.g., kinds of data gathering, controlling variables, reasoning, organization of information, application of the findings, communication) ..... | 0 | 1 | 2 | 3 | 4 |
| 117. Methods of inquiry (e.g., validation of evidence, seeing patterns, making inferences, drawing conclusions, generalizations) .....                                                         | 0 | 1 | 2 | 3 | 4 |
| 118. Unifying themes/concepts in science (e.g., change over time, scale and structure, energy) .....                                                                                           | 0 | 1 | 2 | 3 | 4 |
| 119. The impact of science and technology on society (e.g., bio-engineering, pollution) .....                                                                                                  | 0 | 1 | 2 | 3 | 4 |
| 120. Ethics in science (e.g., animal experimentation, human-subject research, genetic engineering) .....                                                                                       | 0 | 1 | 2 | 3 | 4 |
| 121. Overall evaluation of the importance of Knowledge of Science? .....                                                                                                                       | 0 | 1 | 2 | 3 | 4 |

122. How well do the statements in section E cover the important aspects of Knowledge of Science necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

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Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**F. KNOWLEDGE OF PHYSICAL EDUCATION**

**IMPORTANCE**

- |                                                                                                                                                                                                                        |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 123. Basic elements and components of physical education (e.g., movement experiences, open/limited space activities, sports skills and rules, safety, cooperation and competition between teams and individuals) ..... | 0 1 2 3 4 |
| 124. Progression of motor learning (e.g., simple to complex skill development) .....                                                                                                                                   | 0 1 2 3 4 |
| 125. Overall evaluation of the importance of Knowledge of Physical Education? .....                                                                                                                                    | 0 1 2 3 4 |

126. How well do the statements in section F cover the important aspects of Knowledge of Physical Education necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

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**G. KNOWLEDGE OF HEALTH**

**IMPORTANCE**

- |                                                                                                                              |           |
|------------------------------------------------------------------------------------------------------------------------------|-----------|
| 127. Effects of physical, emotional, and social health on learning .....                                                     | 0 1 2 3 4 |
| 128. Effects of environmental factors on the health of individuals (e.g., pollution, lead-based paint, asbestos) .....       | 0 1 2 3 4 |
| 129. Basic scientific information about a variety of health content areas (e.g., substance abuse, sex education, AIDS) ..... | 0 1 2 3 4 |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**G. KNOWLEDGE OF HEALTH (cont.)**

**IMPORTANCE**

- |                                                                                                                                            |   |   |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 130. Basic information about personal care (e.g., nutrition, dental health, hygiene) .....                                                 | 0 | 1 | 2 | 3 | 4 |
| 131. Characteristics of the healthy person and signs and symptoms of unhealthy conditions .....                                            | 0 | 1 | 2 | 3 | 4 |
| 132. Signs and symptoms of child abuse .....                                                                                               | 0 | 1 | 2 | 3 | 4 |
| 133. Health personnel: their functions, responsibilities, and usefulness to the teacher .....                                              | 0 | 1 | 2 | 3 | 4 |
| 134. Laws, policies, and procedures in schools regarding health matters (e.g., emergencies, accidents, disease control, child abuse) ..... | 0 | 1 | 2 | 3 | 4 |
| 135. Basic emergency care (e.g., CPR, first aid, AIDS precautions) .....                                                                   | 0 | 1 | 2 | 3 | 4 |
| 136. Hazardous conditions on the playground, in the classroom, and elsewhere in the school .....                                           | 0 | 1 | 2 | 3 | 4 |
| 137. Liability issues pertinent to playground, classroom, and elsewhere in school (e.g., related to leaving students unattended) .....     | 0 | 1 | 2 | 3 | 4 |
| 138. Overall evaluation of the importance of Knowledge of Health? .....                                                                    | 0 | 1 | 2 | 3 | 4 |

139. How well do the statements in section G cover the important aspects of Knowledge of Health necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

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Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

| H. <u>KNOWLEDGE OF VISUAL AND PERFORMING ARTS</u>                                                                   | <u>IMPORTANCE</u> |
|---------------------------------------------------------------------------------------------------------------------|-------------------|
| 140. Basic elements of music (e.g., melody, harmony, texture, timbre, form, rhythm) .....                           | 0 1 2 3 4         |
| 141. Genres of music (e.g., classical, jazz, popular) .....                                                         | 0 1 2 3 4         |
| 142. Various music media (e.g., voice, instrumental, recorded) .....                                                | 0 1 2 3 4         |
| 143. Basic elements of visual arts (e.g., line, color, shape) .....                                                 | 0 1 2 3 4         |
| 144. Genres of visual arts (e.g., drawing, sculpture, photography) .....                                            | 0 1 2 3 4         |
| 145. Various visual arts media (e.g., paint, clay, fabric, jewelry) .....                                           | 0 1 2 3 4         |
| 146. Basic elements of dance .....                                                                                  | 0 1 2 3 4         |
| 147. Genres of dance (e.g., classical ballet, modern dance, folk dancing) .....                                     | 0 1 2 3 4         |
| 148. Basic elements and components of drama (e.g., stage directions, affect, voice projection, body language) ..... | 0 1 2 3 4         |
| 149. Genres of drama (e.g., musical, comedy) .....                                                                  | 0 1 2 3 4         |
| 150. Elements common to the arts (e.g., repetition, contrast, imitation) .....                                      | 0 1 2 3 4         |
| 151. The human need for expression through the arts .....                                                           | 0 1 2 3 4         |
| 152. The affective influence of a work of art on the viewer/<br>listener/perceiver .....                            | 0 1 2 3 4         |
| 153. Works of music, dance, drama, and the visual arts across cultures .....                                        | 0 1 2 3 4         |
| 154. Works of music, dance, drama, and the visual arts from various periods<br>of history .....                     | 0 1 2 3 4         |
| 155. Overall evaluation of the importance of Knowledge of Visual and<br>Performing Arts? .....                      | 0 1 2 3 4         |

Regardless of subject matter or grade level taught, how important is it for a newly licensed (certified) secondary school teacher to know the following in order to perform his/her job in a competent manner?

- (0) Not important
- (1) Slightly important
- (2) Moderately important
- (3) Important
- (4) Very important

**H. KNOWLEDGE OF VISUAL AND PERFORMING ARTS (cont.)**

156. How well do the statements in section H cover the important aspects of Knowledge of Visual and Performing Arts necessary for all secondary school teachers, regardless of subject matter or grade level taught?

|             |        |            |      |           |
|-------------|--------|------------|------|-----------|
| 1           | 2      | 3          | 4    | 5         |
| Very Poorly | Poorly | Adequately | Well | Very Well |

What important aspects, if any, are not covered?

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### PART III -- ADDITIONAL COMMENTS

Please use this space to list any important **KNOWLEDGE DOMAINS** that you believe were **NOT** included in this inventory. Also, use the space for any additional comments about the inventory itself.

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

## PART IV -- RECOMMENDATIONS FOR TEST CONTENT

Listed below are eight content domains that may be covered on a test of knowledge of general subjects that all teachers need, regardless of subject matter or grade level taught. If the examination were to contain 100 questions, how many questions do you believe should be included from each content domain?

Please indicate your response using whole numbers (no fractions). If you believe a content domain should not be included in the examination, put a 0 in the space provided. Please make sure that your responses sum to 100.

### CONTENT DOMAIN

### NUMBER OF EXAM QUESTIONS (out of 100)

- |                                                           |       |
|-----------------------------------------------------------|-------|
| A. KNOWLEDGE OF STUDENTS                                  | _____ |
| B. KNOWLEDGE OF READING, LANGUAGE<br>ARTS, AND LITERATURE | _____ |
| C. KNOWLEDGE OF MATHEMATICS                               | _____ |
| D. KNOWLEDGE OF SOCIAL STUDIES                            | _____ |
| E. KNOWLEDGE OF SCIENCE                                   | _____ |
| F. KNOWLEDGE OF PHYSICAL EDUCATION                        | _____ |
| G. KNOWLEDGE OF HEALTH                                    | _____ |
| H. KNOWLEDGE OF VISUAL AND<br>PERFORMING ARTS             | _____ |

TOTAL = 100

## PART V - BACKGROUND INFORMATION

The information that you provide in this section is completely confidential and will be used for research purposes only. Please answer the questions by circling the number that most closely describes you or your professional activities. Unless otherwise indicated, please circle only one response for each question.

157. Where do you work?

- |                            |                    |                    |
|----------------------------|--------------------|--------------------|
| 1. Alabama                 | 18. Kentucky       | 36. Ohio           |
| 2. Alaska                  | 19. Louisiana      | 37. Oklahoma       |
| 3. Arizona                 | 20. Maine          | 38. Oregon         |
| 4. Arkansas                | 21. Maryland       | 39. Pennsylvania   |
| 5. California              | 22. Massachusetts  | 40. Puerto Rico    |
| 6. Colorado                | 23. Michigan       | 41. Rhode Island   |
| 7. Connecticut             | 24. Minnesota      | 42. South Carolina |
| 8. Delaware                | 25. Mississippi    | 43. South Dakota   |
| 9. District of<br>Columbia | 26. Missouri       | 44. Tennessee      |
| 10. Florida                | 27. Montana        | 45. Texas          |
| 11. Georgia                | 28. Nebraska       | 46. Utah           |
| 12. Hawaii                 | 29. Nevada         | 47. Vermont        |
| 13. Idaho                  | 30. New Hampshire  | 48. Virginia       |
| 14. Illinois               | 31. New Jersey     | 49. Washington     |
| 15. Indiana                | 32. New Mexico     | 50. West Virginia  |
| 16. Iowa                   | 33. New York       | 51. Wisconsin      |
| 17. Kansas                 | 34. North Carolina | 52. Wyoming        |
|                            | 35. North Dakota   |                    |

158. Which of the following best describes the area in which you practice?

1. Urban
2. Suburban
3. Rural

159. What is your age?

1. Under 25
2. 25-34
3. 35-44
4. 45-54
5. 55-64
6. 65 and over

(THE SURVEY CONTINUES ON THE NEXT PAGE.)

160. What is your sex?

1. Female
2. Male

161. How do you describe yourself?

1. American Indian, Inuit, or Aleut
2. Asian, Asian American, or Pacific Islander
3. Black or African American
4. Mexican American or Chicano
5. Puerto Rican
6. Latin American, South American, Central American, or other Hispanic
7. White
8. Combination (please specify) \_\_\_\_\_
9. Other (please specify) \_\_\_\_\_

162. What is the highest professional degree you hold?

1. Less than a bachelor's
2. Bachelor's
3. Bachelor's + additional credits
4. Master's or equivalent
5. Master's + additional credits
6. Doctorate

163. Which of the following best describes your current employment status?

1. Temporary substitute (assigned on a daily basis)
2. Permanent substitute (assigned on a longer term basis)
3. Regular teacher (not a substitute)
4. Principal or assistant principal
5. School administrator
6. Curriculum supervisor
7. State administrator
8. College faculty
9. Other (please specify) \_\_\_\_\_

(THE SURVEY CONTINUES ON THE NEXT PAGE.)

164. Which of the following best describes the type of school in which you teach? (Circle ALL that apply.)
1. Elementary
  2. Middle
  3. Junior high
  4. Senior high
  5. Comprehensive secondary (7-12)
  6. College/university
  7. Do not currently teach -- administrator/supervisor
  8. Do not currently teach -- retired
  9. Other (please specify) \_\_\_\_\_
165. Which of the following areas best describes your primary teaching assignment? (Circle only ONE answer.)
1. All or most elementary school subjects
  2. All or most middle school subjects
  3. Special education for handicapped or other exceptional students, including the gifted and talented
  4. Arts (e.g., visual arts, music, theater)
  5. Language arts and communication (e.g., English, foreign language, speech, literature)
  6. Mathematics and computer science (e.g., arithmetic, logic, statistics)
  7. Physical and biological sciences (e.g., general science, biology, physics, chemistry, geology)
  8. Social sciences (e.g., social studies, psychology, sociology, economics, history, government)
  9. Home economics
  10. Business and vocational education (e.g., accounting, shop, craft skills, agriculture)
  11. Health and physical education
  12. Curriculum and instruction
  13. Counseling/educational psychology
  14. Educational foundations
  15. Do not currently teach -- administrator/supervisor
  16. Do not currently teach -- retired
  17. Other (please specify) \_\_\_\_\_

(THE SURVEY CONTINUES ON THE NEXT PAGE.)

166. What grade(s) are you currently teaching? (Circle ALL that apply.)

1. Preschool
2. Kindergarten
3. First
4. Second
5. Third
6. Fourth
7. Fifth
8. Sixth
9. Seventh
10. Eighth
11. Ninth
12. Tenth
13. Eleventh
14. Twelfth
15. Undergraduate
16. Graduate
17. Do not currently teach -- administrator/supervisor
18. Do not currently teach -- retired
19. Other (please specify) \_\_\_\_\_

167. How many years, including the current school year, have you taught?

1. Less than a year
2. 1 to 2 years
3. 3 to 5 years
4. 6 to 10 years
5. 11 to 15 years
6. 16 to 20 years
7. 21 or more years
8. Never taught

THANK YOU FOR PARTICIPATING IN THIS STUDY. PLEASE RETURN THE  
SURVEY WITHIN 10 DAYS IN THE ENCLOSED ENVELOPE.

## Appendix B

### Cover Letter to Survey Participants



609-921-9000  
609-734-1090 (Fax)  
CABLE-EDUCTESTSVC

DIVISION OF COGNITIVE  
AND INSTRUCTIONAL SCIENCE

October, 1991

Dear Colleague:

I am writing to ask your cooperation in a study that should be of importance to teachers, college faculty, administrators, and other professionals in the field of education. As you are undoubtedly aware, the profession is receiving increasing national press as new plans and programs are proposed for assessing teaching. Our response to this call for improvements is to revamp the existing teacher assessment tests offered by Educational Testing Service. One of the many innovative features of these new assessments is the development of constructed responses for the subject matter licensing areas and is based on work done in collaboration with the California Commission on Teacher Credentialing. These Content Area Performance Assessments (CAPA) have been piloted and will be administered this fall in California.

An important step we're taking here at ETS to improve our teacher assessments is to increase the number of teachers providing input into possible test content. In order to do this, we are conducting studies that look closely at the knowledge and skills beginning teachers need in order to be licensed. In some of our studies, we've asked respondents to share their judgments about important enabling skills (e.g., reading comprehension), tasks of teaching (e.g., lesson planning), and knowledge and skills specific to teaching particular subject areas (e.g., mathematics and how to teach mathematics). In this study, we're trying to define knowledge of general subjects that may be important for all beginning teachers, regardless of the grade level or subject matter they teach.

In the developmental process, ETS worked closely with teachers, college faculty, and school administrators to identify potentially important knowledge areas in seven disciplines: reading, language arts, and literature; mathematics; social studies; science; health; physical education; and fine and performing arts. The original survey was developed to cover the content usually taught in the elementary school curriculum and was sent to elementary school teachers. Now we want to find out how important this multi-disciplinary subject matter knowledge is for beginning secondary school teachers, regardless of subject matter or grade level taught. We hope you will be candid as you tell us what is important for beginning secondary school teachers, what is not, and what is missing from this knowledge inventory.

Your opinion is very important. We are sampling only 5100 professionals, therefore the value of the survey results is directly related to the number and completeness of the responses we get. Your responses are confidential. The inventory request for background information about you is solely for purposes of describing this study's respondents.

A postage-paid envelope is enclosed for the return of your completed inventory. Please return the inventory within ten days. If you have any questions about the study or about your participation in it, feel free to call me collect at (609) 921-9000 Ext. 5795. Thank you for your time and participation in this important project.

Cordially,

*Anne Reynolds*

Anne Reynolds, Ph.D.  
Research Scientist

Enclosures (2)

Appendix C

Follow-up Postcard

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**KNOWLEDGE INVENTORY OF GENERAL SUBJECTS**

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Dear Colleague:

I recently sent you an inventory to obtain your opinions of what a newly-licensed teacher should know and be able to do. If you have not already done so, please complete the inventory and return it in the postage-paid envelope to:

Educational Testing Service, 16-R  
Princeton, NJ 08541

If you have already returned the inventory, please accept my thanks for your help in this important project.

Sincerely,

Anne Reynolds, Ph.D.  
Associate Research Scientist

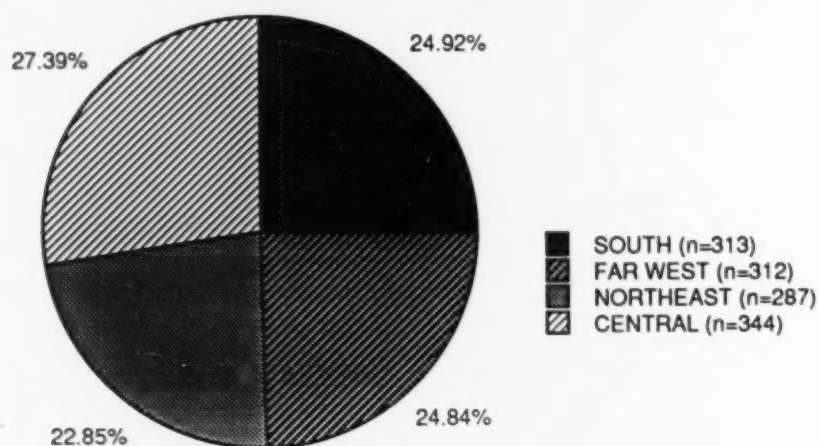
*Anne Reynolds*

## Appendix D

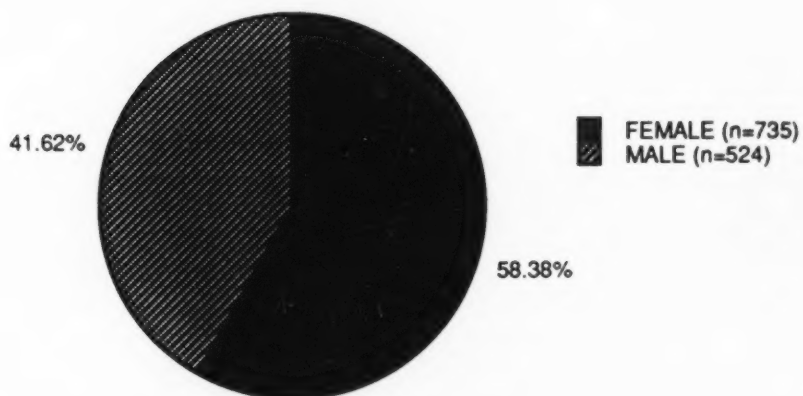
## Demographic Characteristics of the Respondents

NOTE: Some totals sum to less than 1263, the total number of teacher surveys analyzed. This is because on these particular background questions some respondents gave multiple responses and others gave no response. These two types of responses were omitted from the analyses.

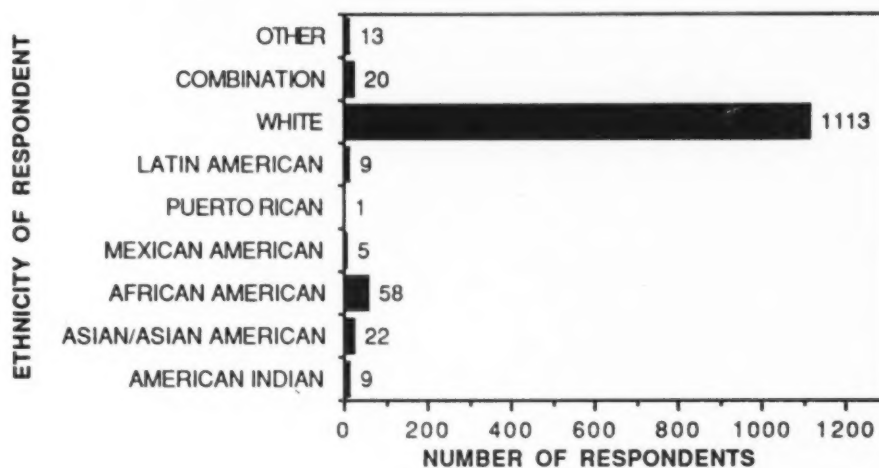
## Teacher Respondents by Geographic Region



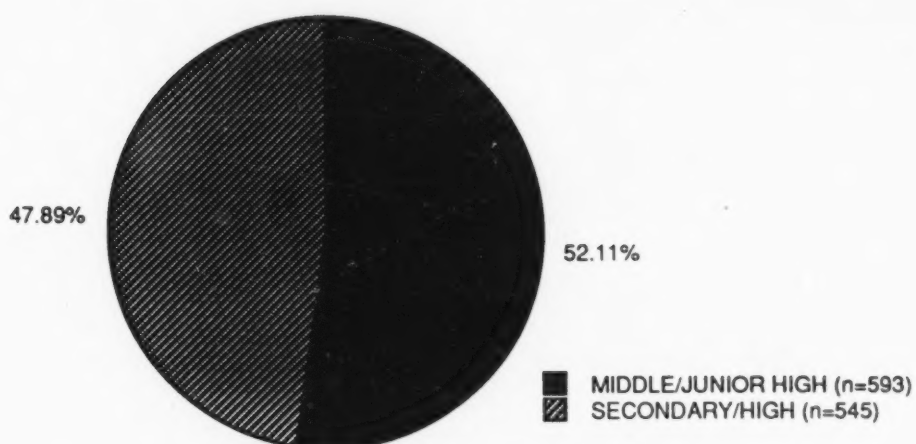
### Teacher Respondents by Sex



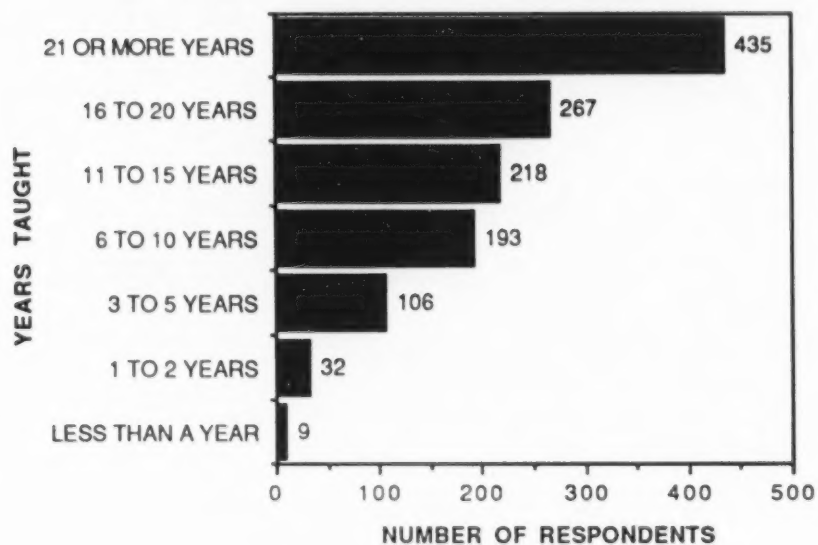
### Teacher Respondents by Ethnicity



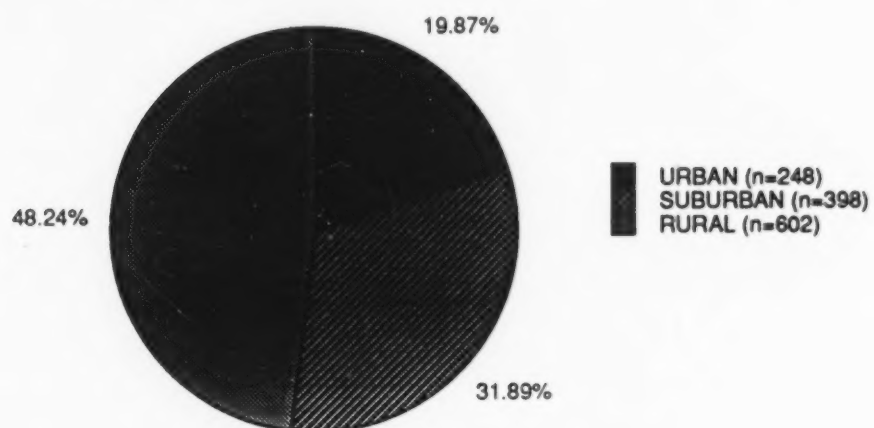
### Teacher Respondents by School Level



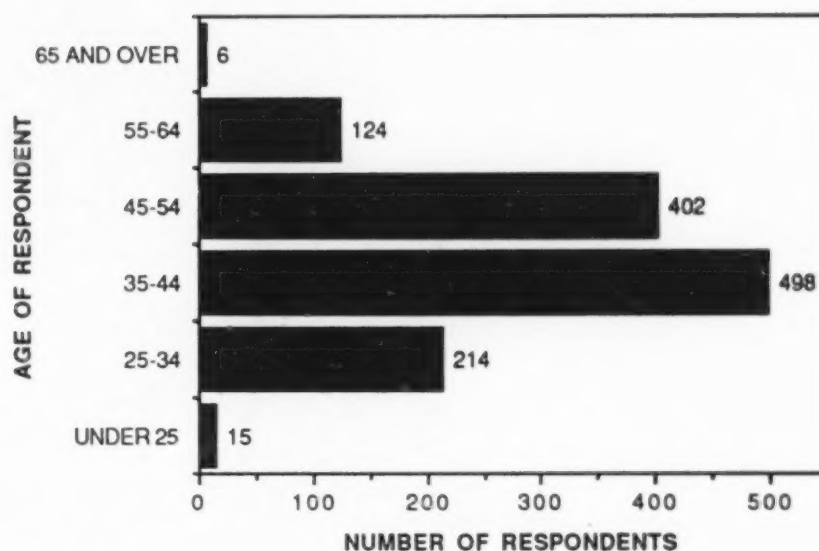
### Teacher Respondents by Number of Years of Teaching Experience



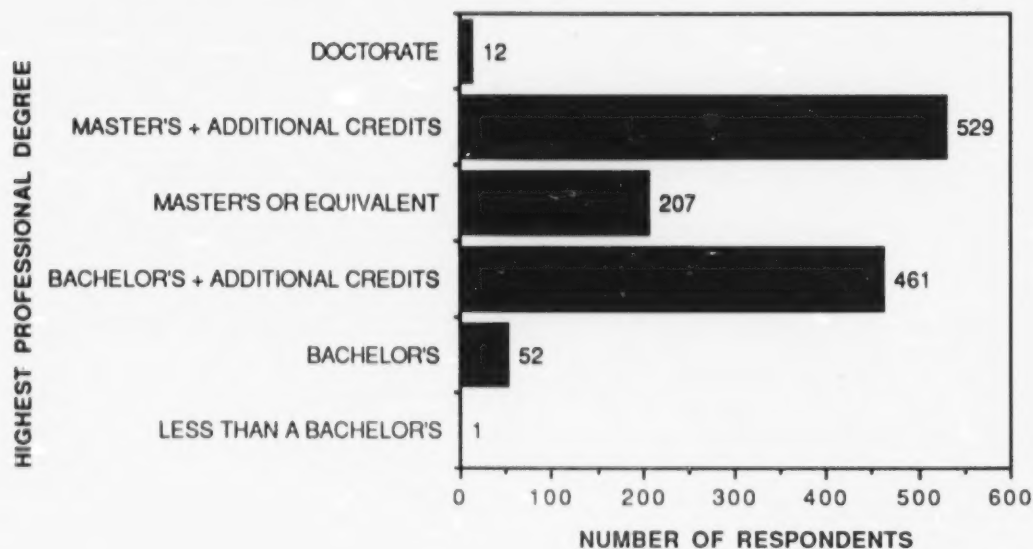
### Teacher Respondents by School Location



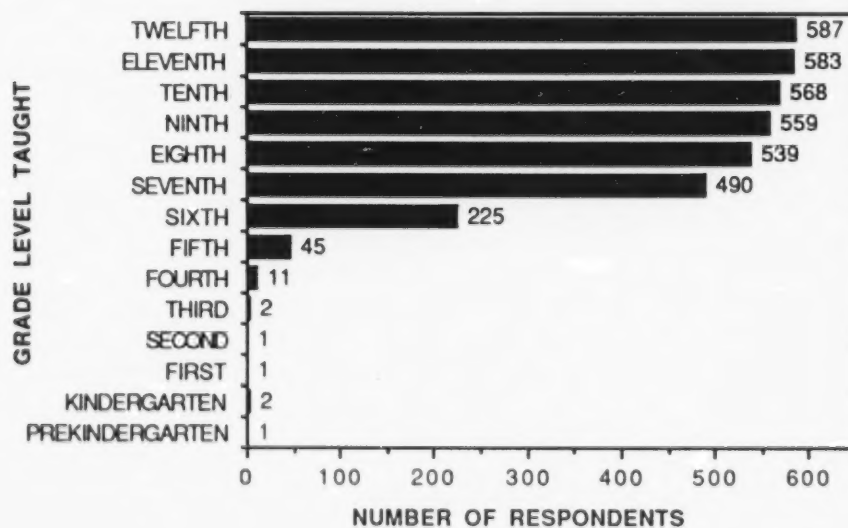
### Teacher Respondents by Age



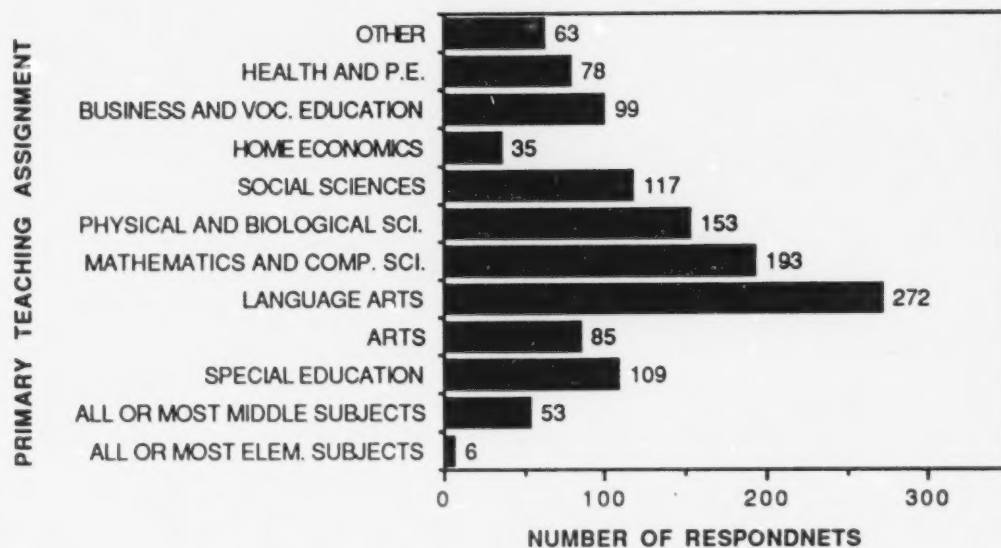
### Teacher Respondents by Highest Degree Held



### Teacher Respondents by Grade Level Taught



### Teacher Respondents by Subject Taught



## Appendix E

## Respondent Means and Standard Deviations

NOTE: Means less than 2.50 are indicated in boldface large type. An asterisk (\*) denotes content coverage questions for which a 5 point scale was used: 1=Very Poorly; 2=Poorly; 3=Adequately; 4=Well; 5=Very Well.

| QUESTION |                                                              | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|--------------------------------------------------------------|---------------------|-----------------------|
| Q1       | biological factors                                           | 2.73                | 0.95                  |
| Q2       | familial factors                                             | 2.86                | 0.95                  |
| Q3       | nutritional/<br>hygienic factors                             | 2.73                | 0.92                  |
| Q4       | cultural factors                                             | 2.86                | 0.90                  |
| Q5       | educational context                                          | 3.16                | 0.80                  |
| Q6       | learning styles                                              | 3.44                | 0.73                  |
| Q7       | cognitive development                                        | 2.97                | 0.85                  |
| Q8       | physical development                                         | 2.75                | 0.88                  |
| Q9       | affective development                                        | 3.32                | 0.74                  |
| Q10      | social development                                           | 2.94                | 0.84                  |
| Q11      | theories of language development                             | <b>1.70</b>         | 1.00                  |
| Q12      | early language acquisition's affect<br>on classroom language | <b>2.01</b>         | 1.05                  |
| Q13      | stages of language acquisition and<br>development            | <b>1.94</b>         | 1.03                  |
| Q14      | second language learning                                     | <b>2.04</b>         | 0.99                  |
| Q15      | principles of linguistics                                    | <b>1.75</b>         | 1.00                  |
| Q16      | OVERALL IMPORTANCE OF<br>KNOWLEDGE OF STUDENTS               | 2.83                | 0.89                  |
| Q17*     | CONTENT COVERAGE<br>OF STUDENTS                              | 3.63                | 0.82                  |

| QUESTION |                                                                                          | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|------------------------------------------------------------------------------------------|---------------------|-----------------------|
| Q 18     | conventions of language                                                                  | 3.57                | 0.63                  |
| Q 19     | language structure                                                                       | 3.18                | 0.82                  |
| Q 20     | word recognition strategies                                                              | 2.91                | 0.85                  |
| Q 21     | text structure                                                                           | 3.21                | 0.79                  |
| Q 22     | comprehension strategies                                                                 | 2.82                | 0.89                  |
| Q 23     | language usage                                                                           | 3.23                | 0.77                  |
| Q 24*    | library skills                                                                           | 3.09                | 0.81                  |
| Q 25     | study skills                                                                             | 3.58                | 0.61                  |
| Q 26     | children's literature                                                                    | <b>2.09</b>         | 1.02                  |
| Q 27     | adult literature                                                                         | <b>2.29</b>         | 0.95                  |
| Q 28     | functional literacy                                                                      | 3.13                | 0.83                  |
| Q 29     | graphic literacy                                                                         | 3.00                | 0.84                  |
| Q 30     | oral communication and<br>presentation skills                                            | 3.44                | 0.72                  |
| Q 31     | creative dramatics                                                                       | <b>2.16</b>         | 1.01                  |
| Q 32     | composing processes                                                                      | 3.00                | 0.90                  |
| Q 33     | types of writing                                                                         | 2.67                | 0.93                  |
| Q 34     | <i>OVERALL IMPORTANCE OF<br/>KNOWLEDGE OF READING,<br/>LANGUAGE ARTS,<br/>LITERATURE</i> | 3.27                | 0.67                  |
| Q 35     | <b>CONTENT COVERAGE<br/>OF READING,<br/>LANGUAGE ARTS,<br/>LITERATURE</b>                | 4.06                | 0.77                  |
| Q 36     | prenumeration                                                                            | 2.59                | 1.00                  |
| Q 37     | numeration                                                                               | 2.74                | 1.00                  |
| Q 38     | number theory                                                                            | <b>2.44</b>         | 1.02                  |
| Q 39     | patterns and functions                                                                   | 2.51                | 0.99                  |
| Q 40     | number sense                                                                             | 2.89                | 0.96                  |
| Q 41     | techniques for computational<br>estimation                                               | 2.92                | 0.92                  |
| Q 42*    | mental mathematics                                                                       | 2.92                | 0.88                  |
| Q 43     | calculator                                                                               | 3.06                | 0.90                  |
| Q 44     | computer                                                                                 | 3.25                | 0.82                  |
| Q 45     | paper/pencil computation                                                                 | 3.23                | 0.82                  |
| Q 46     | whole numbers                                                                            | 3.22                | 0.85                  |

| QUESTION |                                                                  | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|------------------------------------------------------------------|---------------------|-----------------------|
| Q47      | rational numbers                                                 | 3.23                | 0.82                  |
| Q48      | percents                                                         | 3.39                | 0.72                  |
| Q49      | inequalities                                                     | 2.53                | 1.00                  |
| Q50      | integers                                                         | 2.55                | 1.03                  |
| Q51      | geometry and spatial sense                                       | 2.50                | 1.01                  |
| Q52      | measurements                                                     | 2.92                | 0.96                  |
| Q53      | organizing and interpreting data in math                         | 3.26                | 0.78                  |
| Q54      | algebraic methods                                                | 2.63                | 1.02                  |
| Q55      | statistics and probability                                       | <b>2.31</b>         | 1.03                  |
| Q56      | methods of using mathematics                                     | 3.26                | 0.85                  |
| Q57      | methods of mathematical investigation                            | 2.88                | 0.94                  |
| Q58      | strategies for problem solving                                   | 3.15                | 0.87                  |
| Q59      | historical, cultural, and ongoing development of math principles | <b>1.87</b>         | 1.06                  |
| Q60      | OVERALL IMPORTANCE OF KNOWLEDGE OF MATHEMATICS                   | 3.04                | 0.77                  |
| Q61      | CONTENT COVERAGE OF MATHEMATICS                                  | 4.05                | 0.75                  |
| Q62      | methods of inquiry in social studies                             | 3.14                | 0.80                  |
| Q63      | interdependence of humans and physical environment               | 2.86                | 0.90                  |
| Q64      | world cultures                                                   | 2.94                | 0.83                  |
| Q65      | national territories                                             | 2.77                | 0.88                  |
| Q66      | chronology, sequence, change                                     | 2.74                | 0.86                  |
| Q67      | major events and movements in u.s. history                       | 3.08                | 0.81                  |

| QUESTION |                                                                         | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|-------------------------------------------------------------------------|---------------------|-----------------------|
| Q68*     | major events and movements in global history                            | 2.74                | 0.87                  |
| Q69      | interregional relationships over time                                   | 2.58                | 0.91                  |
| Q70      | nature and purpose of government                                        | 3.21                | 0.78                  |
| Q71      | forms of government                                                     | 2.99                | 0.84                  |
| Q72      | traditional political institutions                                      | <b>2.33</b>         | 0.95                  |
| Q73      | united states constitution                                              | 3.29                | 0.78                  |
| Q74      | rights and responsibilities of citizens                                 | 3.49                | 0.68                  |
| Q75      | relations among nations                                                 | 2.78                | 0.86                  |
| Q76      | market as distribution and information system                           | 2.58                | 0.89                  |
| Q77      | individual and the market                                               | 2.51                | 0.90                  |
| Q78      | effects of economic and historical forces on humans and nature          | 2.57                | 0.91                  |
| Q79      | government and the market                                               | <b>2.49</b>         | 0.88                  |
| Q80      | economic systems                                                        | 2.69                | 0.87                  |
| Q81      | culture                                                                 | 2.80                | 0.88                  |
| Q82      | world view                                                              | 2.78                | 0.90                  |
| Q83      | belief systems in various cultures                                      | 2.54                | 0.93                  |
| Q84      | socialization and acculturation                                         | <b>2.49</b>         | 0.89                  |
| Q85      | political, social, and economic conditions of ethnic groups in the u.s. | 2.66                | 0.91                  |
| Q86      | cross-cultural phenomena                                                | 2.89                | 0.90                  |
| Q87      | impact of cultural evolution on different civilizations                 | <b>2.38</b>         | 0.93                  |

| QUESTION |                                                   | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|---------------------------------------------------|---------------------|-----------------------|
| Q88      | physical anthropology                             | <b>2.12</b>         | 0.96                  |
| Q89      | logic                                             | 2.86                | 0.94                  |
| Q90      | ethics                                            | 3.13                | 0.88                  |
| Q91      | philosophical traditions in diverse cultures      | <b>1.84</b>         | 1.03                  |
| Q92      | OVERALL IMPORTANCE OF KNOWLEDGE OF SOCIAL STUDIES | 2.89                | 0.75                  |
| Q93      | CONTENT COVERAGE OF SOCIAL STUDIES                | 3.97                | 0.77                  |
| Q94      | molecules, atoms, and chemical change             | <b>2.34</b>         | 1.00                  |
| Q95      | physical change                                   | 2.53                | 0.96                  |
| Q96      | heat and temperature                              | 2.58                | 0.94                  |
| Q97      | sound                                             | <b>2.46</b>         | 0.92                  |
| Q98      | light                                             | <b>2.47</b>         | 0.92                  |
| Q99      | energy sources                                    | 2.87                | 0.94                  |
| Q100*    | transformation of energy                          | <b>2.46</b>         | 0.99                  |
| Q101     | machines                                          | <b>2.42</b>         | 0.95                  |
| Q102     | magnetism and electricity                         | <b>2.26</b>         | 0.97                  |
| Q103     | flight and space travel                           | 2.51                | 0.95                  |
| Q104     | surface features of the earth                     | 2.69                | 0.96                  |
| Q105     | air and weather                                   | 2.79                | 0.92                  |
| Q106     | sun and planets                                   | 2.53                | 0.93                  |
| Q107     | stars and the universe                            | <b>2.36</b>         | 0.96                  |
| Q108     | history of the earth, solar system, and universe  | <b>2.36</b>         | 1.02                  |
| Q109     | origins of life                                   | 2.57                | 1.04                  |
| Q110     | classification system                             | <b>2.24</b>         | 1.02                  |
| Q111     | human anatomy and physiology                      | 2.87                | 0.93                  |

| QUESTION |                                                               | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|---------------------------------------------------------------|---------------------|-----------------------|
| Q112     | relationships of structure and functions                      | <b>2.45</b>         | 0.97                  |
| Q113     | reproduction and nurturing of the young                       | 2.94                | 0.93                  |
| Q114     | habitat and climate                                           | 2.58                | 0.97                  |
| Q115     | food chains and interdependence                               | 2.71                | 1.00                  |
| Q116     | scientific processes and problem solving                      | 3.07                | 0.93                  |
| Q117     | methods of inquiry                                            | 3.09                | 0.89                  |
| Q118     | unifying themes/concepts in science                           | 2.55                | 1.00                  |
| Q119     | impact of science and technology on society                   | 3.02                | 0.91                  |
| Q120     | ethics in science                                             | 2.79                | 1.01                  |
| Q121     | <i>OVERALL IMPORTANCE OF KNOWLEDGE OF SCIENCE</i>             | 2.84                | 0.81                  |
| Q122     | <b>CONTENT COVERAGE OF SCIENCE</b>                            | 3.98                | 0.78                  |
| Q123     | basic elements and components of physical education           | <b>2.46</b>         | 1.06                  |
| Q124     | progression of motor learning                                 | 2.53                | 1.01                  |
| Q125     | <i>OVERALL IMPORTANCE OF KNOWLEDGE OF PHYSICAL EDUCATION</i>  | 2.46                | 0.98                  |
| Q126     | <b>CONTENT COVERAGE OF PHYSICAL EDUCATION</b>                 | 3.43                | 0.91                  |
| Q127     | effects of physical, emotional, and social health on learning | 3.35                | 0.74                  |
| Q128     | effects of environmental factors on health of individuals     | 2.99                | 0.89                  |
| Q129*    | basic scientific information about health content areas       | 3.48                | 0.72                  |

| QUESTION |                                                                    | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|--------------------------------------------------------------------|---------------------|-----------------------|
| Q 130    | basic information about personal care                              | 3.31                | 0.78                  |
| Q 131    | characteristics of the healthy person                              | 3.37                | 0.70                  |
| Q 132    | signs and symptoms of child abuse                                  | 3.61                | 0.64                  |
| Q 133*   | health personnel                                                   | 2.91                | 0.89                  |
| Q 134    | laws, policies, and procedures in schools regarding health matters | 3.26                | 0.84                  |
| Q 135    | basic emergency care                                               | 3.46                | 0.74                  |
| Q 136    | hazardous conditions in school                                     | 3.24                | 0.83                  |
| Q 137    | liability issues pertinent to school                               | 3.35                | 0.82                  |
| Q 138    | <i>OVERAL IMPORTANCE OF KNOWLEDGE OF HEALTH</i>                    | 3.38                | 0.66                  |
| Q 139    | <i>CONTENT COVERAGE OF HEALTH</i>                                  | 4.12                | 0.78                  |
| Q 140    | basic elements of music                                            | <b>1.79</b>         | 1.06                  |
| Q 141    | genres of music                                                    | <b>1.80</b>         | 1.02                  |
| Q 142    | various music media                                                | <b>1.84</b>         | 1.03                  |
| Q 143    | basic elements of visual arts                                      | <b>2.07</b>         | 1.04                  |
| Q 144    | genres of visual arts                                              | <b>1.95</b>         | 1.02                  |
| Q 145    | various visual arts media                                          | <b>1.77</b>         | 1.01                  |
| Q 146*   | basic elements of dance                                            | <b>1.47</b>         | 1.01                  |
| Q 147    | genres of dance                                                    | <b>1.53</b>         | 1.01                  |
| Q 148    | basic elements and components of drama                             | <b>1.83</b>         | 1.02                  |
| Q 149    | genres of drama                                                    | <b>1.72</b>         | 1.01                  |
| Q 150    | elements common to the arts                                        | <b>1.76</b>         | 1.08                  |

| QUESTION |                                                                                    | Mean<br>n=1173-1251 | Standard<br>Deviation |
|----------|------------------------------------------------------------------------------------|---------------------|-----------------------|
| Q151     | human need for expression through the arts                                         | <b>2.39</b>         | 1.09                  |
| Q152     | affective influence of a work of art on the viewer, listener, perceiver            | <b>2.06</b>         | 1.09                  |
| Q153     | works of music, dance, drama, and the visual arts across cultures                  | <b>2.00</b>         | 1.06                  |
| Q154     | works of music, dance, drama, and the visual arts, from various periods of history | <b>1.87</b>         | 1.06                  |
| Q155     | <i>OVERALL IMPORTANCE OF KNOWLEDGE OF VISUAL AND PERFORMING ARTS</i>               | 2.02                | 0.98                  |
| Q156     | <b>CONTENT COVERAGE OF VISUAL AND PERFORMING ARTS</b>                              | 3.76                | 0.79                  |

## Appendix F

## Knowledge Statements Rated Less than 2.50 by Relevant Subgroups

NOTE: Only subgroups which numbered 30 or more are included in this table.

S=South; FW=Far West; NE=Northeast; C=Central

AF-A=African-American; W=White; OPC=Other People of Color

F=Female; M=Male

0-2=2 or fewer years of teaching experience; 3+=3 or more years of teaching experience

MID=Middle; SEC=Secondary; OTH=Other (e.g., music teachers who teach all grades)

| QUESTION                                                             | TEACHER BY SCHOOL LEVEL |       |       | TEACHER BY GEOGRAPHIC REGION |       |       |       | TEACHER BY RACE/ETHNICITY |        |      | TEACHER BY SEX |       | TEACHER BY YEARS OF TEACHING EXPERIENCE |       |
|----------------------------------------------------------------------|-------------------------|-------|-------|------------------------------|-------|-------|-------|---------------------------|--------|------|----------------|-------|-----------------------------------------|-------|
|                                                                      | MID                     | SEC   | OTH   | S                            | FW    | NE    | C     | AF-A                      | W      | OPC  | F              | M     | 0-2                                     | 3+    |
|                                                                      | n=593                   | n=545 | n=125 | n=313                        | n=312 | n=287 | n=344 | n=58                      | n=1113 | n=79 | n=735          | n=524 | n=41                                    | n=129 |
| <b>DOMAIN A: KNOWLEDGE OF STUDENTS</b>                               |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |       |
| 1 1 theories of language development                                 | 1.85                    | 1.73  | 1.63  | 1.81                         | 1.71  | 1.66  | 1.62  | 2.21                      | 1.65   | 1.95 | 1.74           | 1.64  | 1.90                                    | 1.69  |
| 1 2 early language acquisition's affect on classroom language        | 2.24                    | 2.01  | 1.95  | 2.16                         | 2.07  | 1.89  | 1.93  |                           | 1.97   | 2.18 | 2.06           | 1.94  | 2.24                                    | 2.00  |
| 1 3 stages of language acquisition and development                   | 2.07                    | 1.94  | 1.92  | 2.05                         | 2.03  | 1.84  | 1.86  | 2.47                      | 1.90   | 2.19 | 1.95           | 1.93  | 2.17                                    | 1.94  |
| 1 4 second language learning                                         | 2.13                    | 2.07  | 2.00  | 2.08                         | 2.21  | 1.95  | 1.95  |                           | 1.99   | 2.33 | 2.10           | 1.97  | 2.27                                    | 2.04  |
| 1 5 principles of linguistics                                        | 1.83                    | 1.74  | 1.73  | 1.90                         | 1.79  | 1.62  | 1.67  | 2.23                      | 1.70   | 2.00 | 1.79           | 1.68  | 1.83                                    | 1.74  |
| <b>DOMAIN B: KNOWLEDGE OF READING, LANGUAGE ARTS, AND LITERATURE</b> |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |       |
| 2 6 children's literature                                            | 2.15                    | 2.20  | 1.95  | 2.22                         | 2.10  | 2.08  | 1.97  | 2.37                      | 2.06   | 2.22 | 2.12           | 2.05  | 2.10                                    | 2.09  |
| 2 7 adult literature                                                 | 2.27                    | 2.29  | 2.30  | 2.38                         | 2.26  | 2.38  | 2.18  | 2.35                      | 2.28   | 2.35 | 2.34           | 2.22  | 2.10                                    | 2.30  |
| 3 1 creative dramatics                                               | 2.36                    | 2.13  | 2.14  | 2.21                         | 2.13  | 2.24  | 2.07  | 2.28                      | 2.14   | 2.28 | 2.15           | 2.17  |                                         | 2.14  |

| QUESTION                                                                   | TEACHER BY<br>SCHOOL LEVEL |       |       | TEACHER BY<br>GEOGRAPHIC REGION |       |       |       | TEACHER BY<br>RACE/<br>ETHNICITY |        |      | TEACHER<br>BY<br>SEX |       | TEACHER<br>BY<br>YEARS OF<br>TEACH-<br>ING<br>EXPERI-<br>ENCE |       |
|----------------------------------------------------------------------------|----------------------------|-------|-------|---------------------------------|-------|-------|-------|----------------------------------|--------|------|----------------------|-------|---------------------------------------------------------------|-------|
|                                                                            | MID                        | SEC   | OTH   | S                               | FW    | NE    | C     | AF-A                             | W      | OPC  | F                    | M     | 0-2                                                           | 3+    |
|                                                                            | n=593                      | n=545 | n=125 | n=313                           | n=312 | n=287 | n=344 | n=58                             | n=1113 | n=79 | n=735                | n=524 | n=41                                                          | n=129 |
| <b>DOMAIN C: KNOWLEDGE<br/>OF MATHEMATICS</b>                              |                            |       |       |                                 |       |       |       |                                  |        |      |                      |       |                                                               |       |
| 3 6 prenumeration                                                          |                            |       |       |                                 |       |       | 2.45  |                                  |        |      |                      |       |                                                               |       |
| 3 8 number theory                                                          | 2.44                       |       | 2.34  |                                 | 2.38  | 2.49  | 2.31  |                                  | 2.41   | 2.49 | 2.44                 | 2.45  |                                                               | 2.44  |
| 3 9 patterns and functions                                                 | 2.41                       |       | 2.39  |                                 |       |       | 2.38  |                                  | 2.49   | 2.47 |                      |       |                                                               |       |
| 4 9 inequalities                                                           |                            |       | 2.45  |                                 |       |       | 2.40  |                                  |        |      |                      |       |                                                               |       |
| 5 0 integers                                                               |                            |       | 2.48  |                                 | 2.49  |       | 2.37  |                                  |        |      |                      |       |                                                               |       |
| 5 1 geometry and spatial<br>sense                                          | 2.37                       |       | 2.44  |                                 |       |       | 2.36  |                                  | 2.49   |      | 2.43                 |       |                                                               | 2.49  |
| 5 5 statistics and probability                                             | 2.37                       | 2.31  | 2.30  | 2.32                            | 2.32  | 2.36  | 2.27  | 2.45                             | 2.30   | 2.31 | 2.23                 | 2.43  | 2.49                                                          | 2.31  |
| 5 9 historical, cultural, and<br>ongoing development of<br>math principles | 1.98                       | 1.94  | 1.77  | 1.99                            | 1.91  | 1.82  | 1.76  | 2.18                             | 1.85   | 1.94 | 1.86                 | 1.89  | 1.83                                                          | 1.87  |

| QUESTION                                                    | TEACHER BY SCHOOL LEVEL |       |       | TEACHER BY GEOGRAPHIC REGION |       |       |       | TEACHER BY RACE/ETHNICITY |        |      | TEACHER BY SEX |       | TEACHER BY YEARS OF TEACHING EXPERIENCE |       |
|-------------------------------------------------------------|-------------------------|-------|-------|------------------------------|-------|-------|-------|---------------------------|--------|------|----------------|-------|-----------------------------------------|-------|
|                                                             | MID                     | SEC   | OTH   | S                            | FW    | NE    | C     | AF-A                      | W      | OPC  | F              | M     | 0-2                                     | 3+    |
|                                                             | n=593                   | n=545 | n=125 | n=313                        | n=312 | n=287 | n=344 | n=58                      | n=1113 | n=79 | n=735          | n=524 | n=41                                    | n=129 |
| <b>DOMAIN D: KNOWLEDGE OF SOCIAL STUDIES</b>                |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |       |
| 7 2 traditional political institutions                      | 2.40                    | 2.34  | 2.30  | 2.37                         | 2.28  | 2.40  | 2.27  |                           | 2.30   | 2.46 | 2.36           | 2.28  |                                         | 2.32  |
| 7 7 individual and the market                               |                         | 2.44  |       |                              |       | 2.48  | 2.46  |                           |        | 2.45 |                |       |                                         |       |
| 7 9 government and the market                               |                         | 2.43  |       |                              |       | 2.43  | 2.46  | 2.48                      |        | 2.48 | 2.42           | 2.48  |                                         | 2.49  |
| 8 3 belief systems in various cultures                      |                         |       |       |                              |       |       | 2.48  |                           |        |      |                |       |                                         |       |
| 8 4 socialization and acculturation                         |                         | 2.49  | 2.47  |                              |       |       | 2.45  | 2.46                      |        | 2.46 |                | 2.39  |                                         | 2.47  |
| 8 7 impact of cultural evolution on different civilizations | 2.37                    | 2.41  | 2.34  | 2.39                         | 2.42  | 2.43  | 2.29  |                           | 2.34   |      | 2.42           | 2.32  |                                         | 2.37  |
| 8 8 physical anthropology                                   | 2.10                    | 2.10  | 2.15  | 2.21                         | 2.11  | 2.15  | 2.02  |                           | 2.09   | 2.21 | 2.10           | 2.15  |                                         | 2.10  |
| 9 1 philosophical traditions in diverse cultures            | 1.93                    | 1.79  | 1.87  | 1.85                         | 1.91  | 1.84  | 1.77  | 2.28                      | 1.80   | 2.03 | 1.82           | 1.87  | 2.05                                    | 1.83  |

| QUESTION                                             | TEACHER BY SCHOOL LEVEL |       |       | TEACHER BY GEOGRAPHIC REGION |       |       |       | TEACHER BY RACE/ETHNICITY |        |      | TEACHER BY SEX |       | TEACHER BY YEARS OF TEACHING EXPERIENCE |        |
|------------------------------------------------------|-------------------------|-------|-------|------------------------------|-------|-------|-------|---------------------------|--------|------|----------------|-------|-----------------------------------------|--------|
|                                                      | MID                     | SEC   | OTH   | S                            | FW    | NE    | C     | AF-A                      | W      | OPC  | F              | M     | 0-2                                     | 3+     |
|                                                      | n=593                   | n=545 | n=125 | n=313                        | n=312 | n=287 | n=344 | n=58                      | n=1113 | n=79 | n=735          | n=524 | n=41                                    | n=1219 |
| <b>DOMAIN E: KNOWLEDGE OF SCIENCE</b>                |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |        |
| 94 molecules, atoms, and chemical change             | 2.28                    | 2.37  | 2.32  | 2.43                         | 2.32  | 2.34  | 2.29  |                           | 2.32   | 2.30 | 2.21           |       | 2.37                                    | 2.34   |
| 95 physical change                                   |                         |       |       |                              | 2.48  | 2.49  |       |                           | 2.49   | 2.45 |                |       |                                         |        |
| 97 sound                                             | 2.49                    | 2.48  | 2.43  |                              | 2.43  | 2.42  | 2.41  |                           | 2.44   | 2.45 | 2.37           |       |                                         | 2.45   |
| 98 light                                             |                         | 2.48  | 2.44  |                              | 2.44  | 2.42  | 2.41  |                           | 2.46   | 2.45 | 2.38           |       |                                         | 2.46   |
| 100 transformation of energy                         |                         | 2.45  | 2.46  |                              | 2.48  | 2.43  | 2.36  |                           | 2.44   | 2.49 | 2.37           |       |                                         | 2.45   |
| 101 machines                                         | 2.49                    | 2.43  | 2.39  |                              | 2.38  | 2.33  | 2.39  |                           | 2.40   | 2.45 | 2.31           |       |                                         | 2.41   |
| 102 magnetism and electricity                        | 2.30                    | 2.29  | 2.23  | 2.41                         | 2.23  | 2.21  | 2.20  |                           | 2.24   | 2.32 | 2.14           | 2.43  | 2.40                                    | 2.26   |
| 103 flight and space travel                          |                         |       | 2.47  |                              | 2.47  | 2.45  | 2.47  |                           | 2.48   |      | 2.41           |       |                                         |        |
| 106 sun and planets                                  | 2.45                    |       | 2.46  |                              | 2.49  |       | 2.42  |                           |        |      |                |       |                                         |        |
| 107 stars and the universe                           | 2.31                    | 2.46  | 2.27  |                              | 2.32  | 2.36  | 2.26  |                           | 2.34   | 2.36 | 2.34           | 2.40  | 2.45                                    | 2.36   |
| 108 history of the earth, solar system, and universe | 2.35                    | 2.43  | 2.30  |                              | 2.37  | 2.38  | 2.23  |                           | 2.34   | 2.35 | 2.34           | 2.40  |                                         | 2.36   |
| 109 origins of life                                  |                         |       |       |                              |       | 2.46  |       |                           |        |      |                |       |                                         |        |
| 110 classification system                            | 2.15                    | 2.32  | 2.18  | 2.35                         | 2.20  | 2.21  | 2.20  |                           | 2.20   | 2.28 | 2.19           | 2.31  | 2.42                                    | 2.24   |
| 112 relationships of structure and functions         | 2.41                    |       | 2.40  |                              | 2.46  | 2.40  | 2.38  |                           | 2.43   | 2.44 | 2.40           |       |                                         | 2.45   |
| 118 unifying themes/concepts in science              | 2.40                    |       |       |                              |       | 2.46  |       | 2.47                      |        | 2.47 | 2.49           |       |                                         |        |

| QUESTION                                                                                 | TEACHER BY SCHOOL LEVEL |       |       | TEACHER BY GEOGRAPHIC REGION |       |       |       | TEACHER BY RACE/ETHNICITY |        |      | TEACHER BY SEX |       | TEACHER BY YEARS OF TEACHING EXPERIENCE |       |
|------------------------------------------------------------------------------------------|-------------------------|-------|-------|------------------------------|-------|-------|-------|---------------------------|--------|------|----------------|-------|-----------------------------------------|-------|
|                                                                                          | MID                     | SEC   | OTH   | S                            | FW    | NE    | C     | AF-A                      | W      | OPC  | F              | M     | 0-2                                     | 3+    |
|                                                                                          | n=593                   | n=545 | n=125 | n=313                        | n=312 | n=287 | n=344 | n=58                      | n=1113 | n=79 | n=735          | n=524 | n=41                                    | n=129 |
| <b>DOMAIN F: KNOWLEDGE OF PHYSICAL EDUCATION</b>                                         |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |       |
| 1 2 3 basic elements and components of physical education                                |                         | 2.49  | 2.43  |                              |       | 2.42  | 2.37  |                           | 2.44   |      | 2.45           | 2.49  |                                         | 2.45  |
| 1 2 4 progression of motor learning                                                      |                         |       | 2.47  |                              |       | 2.38  | 2.48  |                           |        |      |                |       |                                         |       |
| <b>DOMAIN H: KNOWLEDGE OF VISUAL AND PERFORMING ARTS</b>                                 |                         |       |       |                              |       |       |       |                           |        |      |                |       |                                         |       |
| 1 4 0 basic elements of music                                                            | 1.97                    | 1.86  | 1.69  | 1.85                         | 1.86  | 1.73  | 1.74  | 2.37                      | 1.76   | 1.86 | 1.76           | 1.85  | 1.93                                    | 1.79  |
| 1 4 1 genres of music                                                                    | 1.93                    | 1.87  | 1.71  | 1.85                         | 1.77  | 1.85  | 1.76  | 2.19                      | 1.79   | 1.72 | 1.81           | 1.80  | 2.10                                    | 1.80  |
| 1 4 2 various music media                                                                | 2.00                    | 1.90  | 1.73  | 1.87                         | 1.89  | 1.85  | 1.75  | 2.19                      | 1.82   | 1.75 | 1.84           | 1.83  | 2.20                                    | 1.82  |
| 1 4 3 basic elements of visual arts                                                      | 2.26                    | 2.12  | 1.97  | 2.12                         | 2.14  | 2.03  | 2.00  | 2.32                      | 2.05   | 2.10 | 2.07           | 2.07  | 2.32                                    | 2.06  |
| 1 4 4 genres of visual arts                                                              | 2.07                    | 2.01  | 1.87  | 1.97                         | 1.99  | 1.96  | 1.90  | 2.09                      | 1.94   | 2.01 | 1.96           | 1.94  | 2.24                                    | 1.95  |
| 1 4 5 various visual arts media                                                          | 1.93                    | 1.83  | 1.66  | 1.83                         | 1.85  | 1.72  | 1.68  | 1.93                      | 1.75   | 1.90 | 1.80           | 1.72  | 2.08                                    | 1.76  |
| 1 4 6 basic elements of dance                                                            | 1.64                    | 1.53  | 1.36  | 1.54                         | 1.53  | 1.43  | 1.38  | 1.76                      | 1.44   | 1.62 | 1.49           | 1.44  | 1.63                                    | 1.46  |
| 1 4 7 genres of dance                                                                    | 1.64                    | 1.61  | 1.43  | 1.61                         | 1.53  | 1.57  | 1.44  | 2.02                      | 1.51   | 1.47 | 1.58           | 1.46  | 1.83                                    | 1.53  |
| 1 4 8 basic elements and components of drama                                             | 1.98                    | 1.85  | 1.78  | 1.83                         | 1.88  | 1.85  | 1.77  | 2.10                      | 1.81   | 1.87 | 1.87           | 1.78  | 2.07                                    | 1.82  |
| 1 4 9 genres of drama                                                                    | 1.80                    | 1.75  | 1.67  | 1.76                         | 1.72  | 1.74  | 1.66  | 1.97                      | 1.71   | 1.66 | 1.74           | 1.69  | 1.95                                    | 1.71  |
| 1 5 0 elements common to the arts                                                        | 1.95                    | 1.78  | 1.69  | 1.76                         | 1.83  | 1.80  | 1.67  | 1.88                      | 1.75   | 1.83 | 1.79           | 1.72  | 2.12                                    | 1.75  |
| 1 5 1 human need for expression through the arts                                         |                         | 2.40  | 2.35  | 2.35                         |       | 2.41  | 2.33  | 2.38                      | 2.39   | 2.38 | 2.48           | 2.27  | 2.49                                    | 2.39  |
| 1 5 2 the affective influence of a work of art on the viewer, listener, perceiver        | 2.14                    | 2.05  | 2.06  | 2.10                         | 2.15  | 2.05  | 1.96  | 2.02                      | 2.06   | 2.17 | 2.13           | 1.97  | 2.44                                    | 2.05  |
| 1 5 3 works of music, dance, drama, and the visual arts across cultures                  | 2.03                    | 2.00  | 1.98  | 2.04                         | 2.05  | 2.03  | 1.88  | 2.21                      | 1.98   | 2.08 | 2.05           | 1.91  | 2.13                                    | 1.99  |
| 1 5 4 works of music, dance, drama, and the visual arts, from various periods of history | 2.02                    | 1.86  | 1.84  | 1.91                         | 1.87  | 1.93  | 1.79  | 2.00                      | 1.87   | 1.82 | 1.91           | 1.81  | 2.02                                    | 1.87  |

